Mathematics Grade 6

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Online:
< http://cnx.org/content/col11030/1.1/ >

CONNEXIONS
Rice University, Houston, Texas
# Table of Contents

## 1 Term 1

1.1 To perform mental calculations ......................................................... 1
1.2 To investigate and extend number patterns ........................................ 4
1.3 To use a series of techniques to perform calculations ....................... 5
1.4 To recognise the place values of digits ............................................. 6
1.5 To recognise and compare numbers ................................................... 8
1.6 To calculate by selecting and using operations appropriate to solving problems ........................................ 9
1.7 To perform mental calculations ......................................................... 10
1.8 To recognise and describe numbers .................................................... 12
1.9 To recognise the place values of digits ............................................. 13
1.10 To use a series of techniques to perform calculations ....................... 14
1.11 To recognise numbers in order to compare them ................................ 15
1.12 To use a series of techniques to perform calculations ....................... 16
1.13 To calculate by selecting appropriate operations for solving problems .... 17
1.14 To perform mental calculations ......................................................... 20
1.15 To recognise and represent numbers in order to describe and compare them .................................................. 21
1.16 To recognise and represent numbers in order to describe and compare them .................................................. 25
1.17 (Untitled) To recognise and represent numbers in order to describe and compare them .................................................. 26
1.18 To calculate by selecting appropriate operations for solving problems .... 31
1.19 To perform mental calculations ......................................................... 38
1.20 To calculate by selecting operations appropriate to solving problems ..... 40
1.21 To recognise and use the properties of addition .................................. 42
1.22 To perform mental calculations ......................................................... 43
1.23 To solve problems in context .......................................................... 45
1.24 To determine the equivalence and validity of different representations .... 47
1.25 To solve problems in context .......................................................... 50
1.26 To use a range of techniques for performing calculations ................... 54
1.27 To solve problems in context .......................................................... 57
1.28 To perform mental calculations ......................................................... 60
1.29 To calculate by selecting operations appropriate to solving problems ..... 63
1.30 To perform mental calculations ......................................................... 64
1.31 To describe and illustrate number systems that differ from our own ....... 65
1.32 To determine the equivalence and validity of different methods ............ 68
1.33 To calculate by choosing methods that are appropriate for solving problem ... 70
1.34 To perform mental calculations ......................................................... 72
1.35 To solve problems in context .......................................................... 73
1.36 To solve problems in context .......................................................... 74
1.37 To solve problems in context .......................................................... 76

## 2 Term 2

2.1 To perform mental calculations ......................................................... 79
2.2 To recognise, classify and represent numbers ..................................... 80
2.3 To recognise, describe and use the properties of whole numbers .......... 82
2.4 To perform mental calculations ......................................................... 85
2.5 To determine output values for given input values .............................. 86
2.6 To use a range of techniques to perform calculations ....................... 89
2.7 To use a range of techniques to perform calculations ....................... 91
2.8 To perform mental calculations ......................................................... 95
2.9 To solve problems in context .......................................................... 96
2.10 To calculate with the help of selected operations appropriate to solving the problem ................................................................. 98
2.11 To calculate with the use of selected operations that are appropriate for solving the problem ...................................................... 100
2.12 To ask simple questions and identify relevant data .......................................................... 101
2.13 To perform mental calculations ...................................................................................... 105
2.14 To recognise, describe and use ...................................................................................... 107
2.15 To use divisibility rules ................................................................................................. 109
2.16 To use a range of techniques for performing calculations .............................................. 112
2.17 To use a range of techniques for performing calculations .............................................. 114
2.18 To investigate and extend patterns ................................................................................ 115
2.19 To use a range of techniques to perform calculations .................................................... 116
2.20 To determine the equivalence and validity of a variety of representations ..................... 117
2.21 To use a range of techniques to perform calculations .................................................... 119
2.22 To perform mental calculations ...................................................................................... 122
2.23 To solve problems in context ......................................................................................... 123
2.24 To perform mental calculations ...................................................................................... 125
2.25 To recognise and classify numbers in order to describe and compare them ................... 127
2.26 To calculate by selecting operations appropriate for solving problems ......................... 132
2.27 To recognise and classify numbers in order to describe and compare them ................... 135
2.28 To perform mental calculations ...................................................................................... 140
2.29 To recognise equivalent forms of numbers To recognise equivalent forms of numbers .......................................................... 143
2.30 ACTIVITY: To calculate by selecting operations appropriate to solving problems ........ 145
2.31 ACTIVITY: To calculate by selecting operations appropriate to solving problems ........ 147
2.32 To calculate by selecting operations appropriate to solving problems .......................... 149
2.33 To solve problems in context ......................................................................................... 151
2.34 To perform mental calculations ...................................................................................... 154
2.35 To calculate by selecting operations appropriate to solving problems .......................... 157
2.36 To perform mental calculations ...................................................................................... 159
2.37 To calculate by selecting operations appropriate to solving problems .......................... 161
2.38 To use a range of strategies to check solutions ................................................................ 163
2.39 To find fractions of whole numbers ............................................................................... 165
2.40 To find fractions of whole numbers ............................................................................... 167
2.41 To record data .............................................................................................................. 170
2.42 Test .............................................................................................................................. 172
2.43 To recognise the place values of digits ............................................................................ 174
2.44 To recognise and classify numbers in order to describe and compare them ................... 176
2.45 To use a range of techniques to perform calculations .................................................... 179
2.46 To recognise and classify numbers in order to describe and compare them ................... 181
2.47 To recognise and classify numbers in order to describe and compare them ................... 182
2.48 To perform mental calculations ...................................................................................... 184
2.49 To count forwards and backwards in decimal fractions .................................................. 186
2.50 To investigate and extend numerical patterns ................................................................. 188
2.51 To recognise and classify numbers in order to describe and compare them ................... 189
2.52 To use a range of techniques to perform calculations .................................................... 192
2.53 To recognise and use equivalent forms of decimal fractions ............................................ 197
2.54 To calculate by selecting operations appropriate to solving problems .......................... 199
2.55 To calculate by selecting operations appropriate to solving problems .......................... 201
2.56 To calculate by selecting operations appropriate to solving problems .......................... 203
### 3 Term 3

<table>
<thead>
<tr>
<th>3.1</th>
<th>To measure and calculate a perimeter ..........................................................</th>
<th>223</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>To perform mental calculations ...........................................................................</td>
<td>226</td>
</tr>
<tr>
<td>3.3</td>
<td>To estimate, measure and record 2-dimensional shapes and 3-dimensional objects ......</td>
<td>228</td>
</tr>
<tr>
<td>3.4</td>
<td>To solve problems involving converting between units .......................................</td>
<td>230</td>
</tr>
<tr>
<td>3.5</td>
<td>To solve problems in context .............................................................................</td>
<td>231</td>
</tr>
<tr>
<td>3.6</td>
<td>To solve problems in context .............................................................................</td>
<td>234</td>
</tr>
<tr>
<td>3.7</td>
<td>To investigate how to determine area ...............................................................</td>
<td>237</td>
</tr>
<tr>
<td>3.8</td>
<td>To calculate area ..................................................................................................</td>
<td>239</td>
</tr>
<tr>
<td>3.9</td>
<td>To calculate area by investigating and estimating ..............................................</td>
<td>241</td>
</tr>
<tr>
<td>3.10</td>
<td>To solve problems in context .............................................................................</td>
<td>242</td>
</tr>
<tr>
<td>3.11</td>
<td>To estimate, measure and record the mass of 2-dimensional shapes and to use appropriate measuring instruments</td>
<td>245</td>
</tr>
<tr>
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<td>To calculate by selecting appropriate operations for solving particular problems</td>
<td>246</td>
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<tr>
<td>3.13</td>
<td>To use appropriate measuring instruments .........................................................</td>
<td>248</td>
</tr>
<tr>
<td>3.14</td>
<td>To calculate by selecting appropriate operations for solving particular problems</td>
<td>249</td>
</tr>
<tr>
<td>3.15</td>
<td>Performing mental calculations ...........................................................................</td>
<td>250</td>
</tr>
<tr>
<td>3.16</td>
<td>To multiply with decimals ...................................................................................</td>
<td>251</td>
</tr>
<tr>
<td>3.17</td>
<td>To solve problems that include converting between S.I. units .............................</td>
<td>253</td>
</tr>
<tr>
<td>3.18</td>
<td>To perform mental calculations ..........................................................................</td>
<td>254</td>
</tr>
<tr>
<td>3.19</td>
<td>To use appropriate measuring instruments .........................................................</td>
<td>256</td>
</tr>
<tr>
<td>3.20</td>
<td>To calculate by using S.I. (Système Internationale) units ...................................</td>
<td>259</td>
</tr>
<tr>
<td>3.21</td>
<td>To investigate and approximate .........................................................................</td>
<td>261</td>
</tr>
<tr>
<td>3.22</td>
<td>To solve problems in context .............................................................................</td>
<td>263</td>
</tr>
<tr>
<td>3.23</td>
<td>To perform mental calculations ..........................................................................</td>
<td>265</td>
</tr>
<tr>
<td>3.24</td>
<td>To read analogue time and write 24-hour time ....................................................</td>
<td>266</td>
</tr>
<tr>
<td>3.25</td>
<td>To solve problems involving operations and conversion of time units ....................</td>
<td>268</td>
</tr>
<tr>
<td>3.26</td>
<td>To solve problems involving time units ................................................................</td>
<td>270</td>
</tr>
<tr>
<td>3.27</td>
<td>To record temperature using degrees Celsius .....................................................</td>
<td>272</td>
</tr>
</tbody>
</table>

### 4 Term 4

<p>| 4.1  | Recognising and describing angles ..................................................................... | 283  |
| 4.2  | Recognising and describing angles ..................................................................... | 287  |
| 4.3  | To recognise and describe angles ....................................................................... | 288  |
| 4.4  | To recognise and name 2-dimensional figures .................................................... | 291  |
| 4.5  | To describe 2-dimensional figures in terms of different properties ..................... | 293  |
| 4.6  | To use the vocabulary and properties of rotations to describe the relationships between 2-D shapes | 294  |
| 4.7  | To draw enlargements and reductions of 2-dimensional figures ........................... | 296  |
| 4.8  | To investigate and compare 2-dimensional figures ............................................. | 298  |
| 4.9  | To describe and classify 3-dimensional figures ................................................... | 304  |
| 4.10 | To recognise, visualise and name 3-dimensional figures ...................................... | 306  |
| 4.11 | To investigate and compare 3-dimensional figures ............................................. | 308  |
| 4.12 | To draw and interpret sketches .......................................................................... | 309  |
| 4.13 | To find specific positions and explaining how to move between positions .............. | 311  |
| 4.14 | To do mental calculations .................................................................................... | 313  |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.15</td>
<td>To use simple tables to collect data and answer questions</td>
<td>314</td>
</tr>
<tr>
<td>4.16</td>
<td>To ask simple questions and identify sources of data</td>
<td>315</td>
</tr>
<tr>
<td>4.17</td>
<td>To draw a number of different graphs</td>
<td>316</td>
</tr>
<tr>
<td>4.18</td>
<td>To read and interpret data critically</td>
<td>320</td>
</tr>
<tr>
<td>4.19</td>
<td>To examine ungrouped numerical data to determine the mode and the median</td>
<td>322</td>
</tr>
<tr>
<td>4.20</td>
<td>To ask simple questions and identifying sources of data</td>
<td>324</td>
</tr>
<tr>
<td>4.21</td>
<td>To predict the likelihood of events in everyday life</td>
<td>325</td>
</tr>
<tr>
<td>4.22</td>
<td>To list possible outcomes to simple experiments</td>
<td>327</td>
</tr>
<tr>
<td>4.23</td>
<td>To count the frequency of actual outcomes for a series of trials</td>
<td>328</td>
</tr>
<tr>
<td>4.24</td>
<td>To do mental arithmetic</td>
<td>330</td>
</tr>
</tbody>
</table>

**Attributions**

334
Chapter 1

Term 1

1.1 To perform mental calculations¹

1.1.1 MATHEMATICS

1.1.2 Number Concept

1.1.3

1.1.4 EDUCATOR SECTION

1.1.5 Memorandum

1. NUMBER CONCEPT

1.1 27

1.2 79

1.3 96

1.4 63

1.5 42.5

1.6 3.2

1.7 100

1.8 300

1.9 294

1.10 992

1.11 8

1.12 55

1.13 63

1.14 +

1.15 445

¹This content is available online at <http://cnx.org/content/m20127/1.1/>.
1.1.6 LEARNER SECTION

1.1.6.1 Content

1.1.6.2 Solve the following puzzle

<table>
<thead>
<tr>
<th>B</th>
<th>C</th>
<th>E</th>
<th>H</th>
<th>I</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
<th>R</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>11</td>
<td>5</td>
<td>14</td>
<td>21</td>
<td>7</td>
<td>2</td>
<td>6</td>
<td>8</td>
<td>4</td>
<td>18</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 1.1

1.1.6.3 Clues:

<table>
<thead>
<tr>
<th>1. 24 \div 12</th>
<th>2. 5 + 7</th>
<th>3. 11 - 4</th>
<th>4. 8 + 9</th>
<th>5. 20 \div 4</th>
<th>6. 13 - 9</th>
<th>7. 20 - 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. 36 \div 6</td>
<td>9. 14 \div 7</td>
<td>10. 17 - 6</td>
<td>11. 25 \div 5</td>
<td>12. 2 \times 4</td>
<td>13. 27 - 9</td>
<td>14. 25 \div 4</td>
</tr>
</tbody>
</table>

Table 1.2

Write your answer here: ________________________________________________

1.1.6.4 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. In Mathematics it is important to be able to think fast. Let’s see how quick you are in your first mental arithmetic test in Grade 6. Work as quickly and as accurately as possible.

1.1.6.5 1. Think fast!

In Mathematics it is important to be able to think fast. Let’s see how quick you are in your first mental arithmetic test in Grade 6. Work as quickly and as accurately as possible.

<table>
<thead>
<tr>
<th>1.1 56 + ............... = 83</th>
<th>1.4 ............... [U+F0B8] 9 = 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 49 \times 15 = ...........</td>
<td>1.5 Halve 85: ...............</td>
</tr>
<tr>
<td>1.3 12 \times 8 = ...........</td>
<td>1.6 Double 163: ...............</td>
</tr>
<tr>
<td>1.7 20 \times ............... = 2 000</td>
<td>1.12 A half \times ............... = 150</td>
</tr>
<tr>
<td>1.8 (7 \times 9) - 8 ...........</td>
<td>1.13.. (38 + 49) - 24 = ...............</td>
</tr>
<tr>
<td>1.9 98 + 99 + 97 = ...........</td>
<td>1.14 89 ............... 16 = 105</td>
</tr>
<tr>
<td>1.10 1 004 - 12 = ...........</td>
<td>1.15 998 - ............... = 550</td>
</tr>
<tr>
<td>1.11 8 \times 9 \times 6 = 6 \times ........... \times 9</td>
<td></td>
</tr>
</tbody>
</table>

Table 1.3

Complete: I have ________________________________________ correct!!
1.1.6.6 DID YOU KNOW?

The ancient Romans developed their counting system more than 2000 years ago and some of their numbers looked like this: I; II; III; IV; V.

Figure 1.1

Can you remember what numbering system we make use of today?

1.1.6.7 2. Let’s count

Work with a friend and take turns to count in:

2.1 tens from 19870 to 20040
2.2 hundreds from 67403 backwards to 65903

• thousands from 37556 backwards to 29556
• ten thousands from 25526 to 95526

1.1.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction;
1.9.2: multiplication of whole numbers to at least 12 x 12.
1.2 To investigate and extend number patterns

1.2.1 MATHEMATICS

1.2.2

1.2.3 Number Concept

1.2.4

1.2.5

1.2.6 EDUCATOR SECTION

1.2.7

1.2.8

1.2.9 Memorandum

1.1 50 800; 50 750; 50 600

1.2 20 600; 20 800; 21 000; 21 200

1.3 63 726; 62 726; 59 726; 58 726

1.4 69 625; 79 625; 89 625; 99 625

1.2.10 Learner Section

1.2.10.1 Content

1.2.10.1.1 ACTIVITY: To investigate and extend number patterns [LO 2.1.1]

1. When we work with number patterns we either add or subtract to find the next number in the row. See if you can discover the pattern and then fill in the missing numbers:

1.1 50 850; ____________ ; __________ ; 50 700 ; 50 650 ; ______________

1.2 20 200 ; 20 400 ; ____________ ; ___________ ; __________ ; __________

1.3 ___________ ; ___________ ; 61 726 ; 60 726 ; ___________ ; __________

1.4 ___________ ; ___________ ; 61 726 ; 60 726 ; ___________ ; __________

1.2.11 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.1: We know this when the learner investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns

2.1.1 represented in physical or diagrammatic form.

2This content is available online at <http://cnx.org/content/m19993/1.1/>. 
1.3 To use a series of techniques to perform calculations

1.3.1 MATHEMATICS

1.3.2 Number Concept

1.3.3

1.3.4 EDUCATOR SECTION

1.3.5 Memorandum

1.1 \(50\,000 + 400 + 30 + 6\)

1.2 \(90\,000 + 800 + 10 + 7\)

1.3.5.1 PUZZLE!

100 000

100 000; hundred thousand

1.3.6 Leaner Section

1.3.6.1 Content

1.3.6.2 ACTIVITY: To use a series of techniques to perform calculations [1.10.3]

1. Do you still remember what "expanded notation" is? Quickly explain it to a partner! Then look at the example and see whether you can write the following numbers in expanded notation:

\[\text{e.g. } 36\,518 = 30\,000 + 6\,000 + 500 + 10 + 8\]

1.1 \(50\,436 = \)

1.2 \(98\,017 = \)

1.3.6.3 PUZZLE!

What number is 10 times larger than 10 000?

Fill in the missing answers:

\[9 + 1 = 10\text{ ten}\]

\[99 + 1 = 100\text{ one hundred}\]

\[999 + 1 = 1\,000\text{ one thousand}\]

\[9\,999 + 1 = 10\,000\text{ ten thousand}\]

\[99\,999 + 1 = \] _______________ _______________

* Let us see if you were correct!

<table>
<thead>
<tr>
<th>Hundred thousand</th>
<th>Ten thousand</th>
<th>Thousand</th>
<th>Hundred</th>
<th>Ten</th>
<th>One</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTh</td>
<td>TTh</td>
<td>Th</td>
<td>H</td>
<td>T</td>
<td>U</td>
</tr>
<tr>
<td>(10 \times 10 \times 10 \times 10 \times 10)</td>
<td>(10 \times 10 \times 10 \times 10)</td>
<td>(10 \times 10 \times 10)</td>
<td>(10 \times 10)</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

*Table 1.4

We read 318 526 as three hundred and eighteen thousand five hundred and twenty six.

You were therefore correct if you said 100 000 (hundred thousand).

\(^{3}\text{This content is available online at <http://cnx.org/content/m19995/1.1/>}.\)
1.3.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.3: building up and breaking down numbers

1.4 To recognise the place values of digits

### 1.4.1 MATHEMATICS

#### 1.4.2 Number Concept

1.4.3

#### 1.4.4 EDUCATOR SECTION

1.4.5 Memorandum

<table>
<thead>
<tr>
<th></th>
<th>HD</th>
<th>TD</th>
<th>D</th>
<th>H</th>
<th>T</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>6</td>
<td>0</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>1.2</td>
<td>5</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>1.3</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1.4</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>1.5</td>
<td>4</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 1.5

3.1 $576\,826 = 500\,000 + 70\,000 + 6\,000 + 800 + 20 + 6$
3.2 $894\,392 = 800\,000 + 90\,000 + 4\,000 + 300 + 90 + 2$

#### 1.4.6 LEANER SECTION

1.4.6.1 Content

1.4.6.2 ACTIVITY: To recognise the place values of digits [LO 1.4.1]

1.4.6.3 To use a series of techniques to perform calculations [LO 1.10.3]

1. Let’s see if you are able to apply your knowledge about hundred thousands. Write the following numbers correctly into the table:

<table>
<thead>
<tr>
<th></th>
<th>HT</th>
<th>TT</th>
<th>T</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>60</td>
<td>980</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>50</td>
<td>813</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1.3</td>
<td>500</td>
<td>46</td>
<td>6</td>
<td></td>
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<tr>
<td>1.4</td>
<td>800</td>
<td>26</td>
<td>40</td>
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<tr>
<td>1.5</td>
<td>400</td>
<td>70</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4This content is available online at <http://cnx.org/content/m19997/1.1/>. 
2. If you are able to “read” a number line correctly, you will be able to determine exactly where any number fits in. Work with a partner and use arrows to indicate the approximate positions of the following numbers in the number line.

2.1 318 500
2.2 347 899
2.3 372 000
2.4 398 799
2.5 403 000

3. In Activity 1.3 you have had the opportunity to write numbers in expanded notation. See if you can also do it correctly with the following numbers:

e.g. 26 113 = 20 000 + 6 000 + 100 + 10 + 3

3.1 576 826 =
3.2 894 392 =

1.4.6.3.1 DO YOU STILL REMEMBER?

= means it is equal to
\(\neq\) means it is not equal to
< means it is smaller than
\(\geq\) means it is bigger than

1.4.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 1.4:** We know this when the learner recognises the place value of digits in:

**1.4.1** whole numbers to at least 9-digit numbers

**Learning Outcome 1:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

**1.10.3:** building up and breaking down numbers
1.5 To recognise and compare numbers

1.5.1 MATHEMATICS

1.5.2 Number Concept

1.5.3

1.5.4 EDUCATOR SECTION

1.5.5 Memorandum

1.1 >
1.2 <
1.3 =
1.4 >
1.5 =

1.5.6 LEANER SECTION

1.5.6.1 Content

1.5.6.2 ACTIVITY: To recognise and compare numbers [LO 1.3.1]

1. Look carefully at the following numbers and say each one out loud. Then see whether you are able to fill in the correct relationship signs (<; > or =) by comparing them:

1.1 216 847 * 126 847
1.2 489 607 * 489 670
1.3 10 000 * 10 * 200 000 ÷ 2
1.4 10 * 10 * 10 * 10 * 100 000 ÷ 100
1.5 1 000 * 100 * 100 * 10 * 100

1.5.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

This content is available online at <http://cnx.org/content/m19999/1.1/>.
1.6 To calculate by selecting and using operations appropriate to solving problems⁶

1.6.1 MATHEMATICS
1.6.2 Number Concept
1.6.3

1.6.4 EDUCATOR SECTION
1.6.5 Memorandum

1.1 1 065
1.2 2 466
1.3 28 745
1.4 50 271
1.5 373 097
1.6 462 563

1.6.5.1 PUZZLE!

12 54 24
42 30 18
36 6 48

1.6.6 LEANER SECTION
1.6.6.1 Content

1.6.6.2 ACTIVITY: To calculate by selecting and using operations appropriate to solving problems [LO 1.8.2]

1.6.6.3 To use a series of techniques to perform calculations [LO 1.10.1]

1. Read the following questions attentively. Then decide which operations you need to use to find the answers. Use your pocket calculator and write down the number that is:

   1.1 398 more than 467
   1.2 2 346 less than 4 812
   1.3 5 098 more than 23 647
   1.4 46 138 less than 96 409
   1.5 123 516 more than 249 581
   1.6 435 091 less than 897 654

1.6.6.4 PUZZLE!

   - Complete the following magic square. The sum of the numbers down, across or diagonally is 90.

   | 12 | _______ | _______ |
   |____|_______|_______|
   |____| 30    | 18     |
   |____|_______|_______|

⁶This content is available online at <http://cnx.org/content/m20003/1.1/>. 
1.6.6.5 TIME FOR SELF-ASSESSMENT

| I can count forwards and backwards in hundreds. (LO 1.9) | 1 2 3 4 |
| I can count forwards and backwards in thousands. (LO 1.9) | 1 2 3 4 |
| I can count forwards and backwards in ten thousands. (LO 1.9) | 1 2 3 4 |
| I can complete number sequences by observing the patterns. (LO 2.1) | 1 2 3 4 |
| I can write numbers by means of expanded notation. (LO 1.10) | 1 2 3 4 |
| I am able to read hundred thousands from a number line. (LO 1.4 en LU 1.10) | 1 2 3 4 |
| I can fill in the relationship signs (<; >; =) correctly. (LO 1.3) | 1 2 3 4 |

Table 1.8

1.6.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers.

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.1: adding, subtracting and multiplying in columns.

1.7 To perform mental calculations

1.7.1 MATHEMATICS

1.7.2 Number Concept

1.7.3

1.7.4 EDUCATOR SECTION

1.7.5 Memorandum

- 203; 190; 173; 208; 236; 222; 253; 471; 570; 459; 423; 472; 430; 343; 453; 357; 315

1 000 000

---

7This content is available online at <http://cnx.org/content/m20005/1.1/>.
1.7.6 LEANER SECTION

1.7.6.1 Content

1.7.6.2 ACTIVITY: To perform mental calculations [LO 1.8.2]

1.7.6.3 COMPETITION TIME!

- Compete with a friend to see who can complete this arrow diagram CORRECTLY first! You may not use a pocket calculator.

---

**Figure 1.3**

---

1.7.6.3.1 THE REMARKABLE MILLION!

You already know the following:

10 x 10 = 100
100 x 10 = 1 000
1 000 x 10 = 10 000
10 000 x 10 = 100 000

Look carefully at the above pattern and fill in:

100 000 x 10 = ..................................................

Correct! 100 000 x 10 = 1 000 000

We read: 1 000 000 is one million
• In the notation column it looks like this:

<table>
<thead>
<tr>
<th>Million</th>
<th>Hundred thousand</th>
<th>Ten thousand</th>
<th>Thousand</th>
<th>Hundred</th>
<th>Ten</th>
<th>One</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>HTh</td>
<td>TTh</td>
<td>Th</td>
<td>H</td>
<td>T</td>
<td>U</td>
</tr>
<tr>
<td>1 000 000</td>
<td>100 000</td>
<td>10 000</td>
<td>1 000</td>
<td>100</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1.9

• Let’s read these big numbers:

4 721 568 is read as 4 million 721 thousand 568

Thus: Four million seven hundred and twenty one thousand five hundred and sixty eight

1.7.6.3.2 NOTE!

We group figures (digits) in threes from the right.

In the example the first space from the left tells us how many millions we have. The second space from the left indicates how many thousands there are.

E.g. 3 (million) 268 (thousand) 413

1.7.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction.

1.8 To recognise and describe numbers*  

1.8.1 MATHEMATICS

1.8.2 Number Concept

1.8.3

1.8.4 EDUCATOR SECTION

Memorandum

1.1 four million one hundred and thirty six thousand two hundred and eighty four

1.2 eight million two hundred forty seven thousand and nine

1.3 three million six thousand five hundred

2.1 5 400 816

2.2 2 620 018

2.3 12 700 006

*This content is available online at <http://cnx.org/content/m20007/1.1/>.
1.8.5 LEARNER SECTION

1.8.5.1 Content

1.8.5.2 ACTIVITY: To recognise and describe numbers [LO 1.3.1]

1. On page 6 we saw how large numbers (hundred thousands) have to be read and how we write them as words. The above example shows how we read and write millions. Take another careful look at it and then write the following numbers in words:

1.4 136 284

1.2 847 009

1.3 006 500

2. Here the numbers have been written out in words. See if you can write them in figures:

2.1 Five million four hundred thousand eight hundred and sixteen

2.2 Two million six hundred and twenty thousand and eighteen

2.3 Twelve million seven hundred thousand and six

1.8.6 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

1.9 To recognise the place values of digits⁹

1.9.1 MATHEMATICS

1.9.2 Number Concept

1.9.3

1.9.4 EDUCATOR SECTION

1.9.5 Memorandum

1.1 200 000

1.2 5 000 000

1.3 80 000

1.4 20 000 000

⁹This content is available online at <http://cnx.org/content/m20009/1.1/>.
1.9.6 LEANER SECTION

1.9.6.1 Content

1.9.6.2 ACTIVITY: To recognise the place values of digits [LO. 1.4.1]

1. If we know what the place value of a digit is, it is child’s play to determine the value of that digit. Look at the following numbers. Write down the values of the digits in bold print:
   - e.g.: 456 981 80
   - 1.1 321 641
   - 1.2 5641 218
   - 1.3 4186 046
   - 1.4 23521 000

1.9.6.2.1 DID YOU KNOW?

If you started to count in seconds, it would take you almost 12 days to count to a million!

1.9.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.4:** We know this when the learner recognises the place value of digits in:

1.4.1: whole numbers to at least 9-digit numbers

1.10 To use a series of techniques to perform calculations

1.10.1 MATHEMATICS

1.10.2 Number Concept

1.10.3

1.10.4 EDUCATOR SECTION

1.10.5 Memorandum

1.1 16 667
   - 694
   - 2

2. No. Would have been 2 739 years old

1.10.6 LEANER SECTION

1.10.6.1 Content

1.10.6.2 Activity: To use a series of techniques to perform calculations [LO 1.10.5]

1. Use your pocket calculator and write down the answers to the nearest counting number (e.g. 26,893 = 27)

1.1

1 million minutes = ____________________________ hours
   = ____________________________ days
   = ____________________________ year

10This content is available online at <http://cnx.org/content/m20010/1.1/>.
2. Have you already been on the earth for a million days?
   Explain your answer to a friend.

1.10.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.5: using a calculator.

1.11 To recognise numbers in order to compare them

1.11.1 MATHEMATICS

1.11.2 Number Concept

1.11.3

1.11.4 EDUCATOR SECTION

1.11.5 Memorandum

1. Appelfontein
2. Radysland
3. Lemoenburg
4. Kersieville
5. Perskstad

1.11.6 LEARNER SECTION

1.11.6.1 Content

1.11.6.2 ACTIVITY: To recognise numbers in order to compare them [LO 1.3.1]

1. First read the following numbers out loud to a partner. Then arrange the towns from LARGE to small according to their populations.

<table>
<thead>
<tr>
<th>TOWN</th>
<th>POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherryville</td>
<td>7 146 086</td>
</tr>
<tr>
<td>Appleton</td>
<td>11 086 413</td>
</tr>
<tr>
<td>Sunland</td>
<td>11 006 412</td>
</tr>
<tr>
<td>Peachville</td>
<td>3 159 886</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>7 146 213</td>
</tr>
</tbody>
</table>

1.11.6.3 DID YOU KNOW?

1 000 million is a MILLIARD or BILLION!

---

11"This content is available online at <http://cnx.org/content/m20011/1.1/>.
1.11.6.4 DID YOU ALSO KNOW?

We can write 10 as 101.

We say 10 to the power of 1

This means:

10 x 1 = 10

10^2 = 10 to the power of 2
= 10 x 10 = 100

10^3 = 10 to the power of 3
= 10 x 10 x 10 = 1 000

10^4 = 10 to the power of 4
= 10 x 10 x 10 x 10 = 10 000

1.11.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

1.12 To use a series of techniques to perform calculations\(^{12}\)

1.12.1 MATHEMATICS

1.12.2 Number Concept

1.12.3

1.12.4 EDUCATOR SECTION

1.12.5 Memorandum

1. 10 x 10 x 10 x 10 x 10
   100 000
   10 x 10 x 10 x 10 x 10 x 10
   1 000 000
   2.1 2 x 2 x 2 = 8
   2.2 3 x 3 x 3 x 3 = 81
   2.3 5 x 5 x 5 = 125
   2.4 1 000 ÷ 100 = 10
   2.5 10 x 10 x 10 x 10 x 10 = 100 000
   2.6 6
   2.7 9

1.12.6 LEARNER SECTION

1.12.6.1 Content

1.12.6.2 ACTIVITY: To use a series of techniques to perform calculations [LO 1.10.3]

1. Study the examples above and then complete the following:

\(^{12}\)This content is available online at <http://cnx.org/content/m20013/1.1/>. 
10^5 = =  
= 10^6 = 

2. Can you also write down the answers to the following?
e.g. \(52 = 5 \times 5 = 25\)
2.1  \(23 =\)
2.2  \(34 =\)
2.3  \(33 =\)
2.4  \(103, 102 =\)
2.5  \(10 \times 104 =\)
2.6 one million = \(10^6\)
2.7 one billion = \(10^9\)

1.12.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.10:** We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.10.3: whole numbers to at least 9-digit numbers.

1.13 To calculate by selecting appropriate operations for solving problems

1.13.1 MATHEMATICS

1.13.2 Number Concept

1.13.3

1.13.4 EDUCATOR SECTION

1.13.5 Memorandum

1. Look at the tenth digit. If 5 or more, add one to hundredth number. If 4 or less the hundredth number stays the same. Replace tenth and one-numbers with nought.

2. Hundreds
   thousands add one
   hundreds, tens and ones
   3.1 8 000 8 000
   3.2 47 200 47 000
   3.3 150 500 151 000
   3.4 3 409 200 3 409 000
   3.5 5 631 000 5 631 000

1.13.5.1 Brain Teaser

i) R\(90 000\)

ii) R\(14 000\)

---

This content is available online at <http://cnx.org/content/m20018/1.1/>. 
1.13.6 LEARNER SECTION

1.13.6.1 Content

1.13.6.2 ACTIVITY: To calculate by selecting appropriate operations for solving problems[LO 1.8.1]

1. In Grade 5 we saw repeatedly how important it was to round off correctly. Amongst other things, it can help us to estimate an answer quickly, without using pencil and paper.

1.13.6.2.1 ROUNDOFF

- Let’s revise
- Explain to your friend how we round off to the nearest 100.

2. Try to complete the following on your own:

---

**ROUNDOFF TO THE NEAREST 1 000**

Look at the _______________ figure

Is it less than 5?  

- The _______________ figure remains the same

Is it 5 or more?  

- The thousand _______________ figure

Now replace the _______________ ,  

_______________ and the _______________ figures with a 0

---

Figure 1.4

If you are unable to do it on your own, ask a friend to help you!

3. Complete the following table:
Table 1.11

<table>
<thead>
<tr>
<th>number</th>
<th>rounded off to the nearest 100</th>
<th>rounded off to the nearest 1 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>7 995</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>47 216</td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>150 505</td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>3 409 235</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>5 630 981</td>
<td></td>
</tr>
</tbody>
</table>

1.13.6.3 PUZZLE!

- Can you round off the following to the nearest 10 000?

i) __________________________________________________________________

Price R89 895

ii) __________________________________________________________________

Price R13 995

TIME FOR SELF-ASSESSMENT

How well do you understand the preceding work? Assess yourself on a scale of 1 to 4. Circle the appropriate code:

1 = needs attention
2 = fairly good
3 = very good
4 = excellent

Criteria:

<table>
<thead>
<tr>
<th>I can read 7-digit numbers correctly. (LO 1.3)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I can write 7-digit numbers correctly in words. (LO 1.3)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I am able to determine the value of digits in a number correctly. (LO 1.4)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I understand the powers of 10 and can use them correctly. (LO 1.10)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I can round off correctly to the nearest 100. (LO 1.8)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I can round off correctly to the nearest 1 000. (LO 1.8)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I can round off correctly to the nearest 10 000. (LO 1.8)</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1.12

1.13.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000.
1.14 To perform mental calculations

1.14.1 MATHEMATICS

1.14.2 Number Concept

1.14.3 EDUCATOR SECTION

1.14.4

1.14.5 Memorandum

1.18

1.2 12
1.3 775
1.4 2 700
1.5 * +7
1.6 11
1.7 9 rem 3
1.8 9 000
1.9 6 248
1.10 504
1.11 350
1.12 200
1.13 45
1.14 8
1.15 6 rem 5

1.14.6 LEARNER SECTION

1.14.6.1 Content

1.14.6.2 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. It is time to see whether you are able to improve your skill in mental calculation. Without using a pocket calculator, work as quickly and accurately as possible:

1.1 ________ x 9 = 72 1.9
1.2 ________ x 8 = 96
1.3 5 000 − 4 225 = ________
1.4 2 575 + 125 = ________
1.5 (7 x ________ + 7 = 70
1.6 (5 x 9) − ________ = 34
1.7 84, 9 = ________

• Round off to the nearest 1 000: 9 450: ________
• Double: 3 124: ________

1.10 Halve 1 008: ________
1.11 250 + 25 + 75 = ________
1.12 (9 x 12) + 92 = ________
1.13 (12 x 12) − ________ = 99
1.14 (42 + ________) x 100 = 5 000
1.15 53 , 8 = ________

14This content is available online at <http://cnx.org/content/m20019/1.1/>. 
I got ________________________________ out of the 15 correct!
Colour the appropriate space: I have:

| IMPROVED | WEAKENED | THE SAME MARK AS WITH MY FIRST TEST |

Table 1.13

1.14.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction;
1.9.2: multiplication of whole numbers to at least 12 x 12.

1.15 To recognise and represent numbers in order to describe and compare them

1.15.1 MATHEMATICS

1.15.2 Number Concept

1.15.3

1.15.4 EDUCATOR SECTION

1.15.5 Memorandum

2.1 Prime numbers: 11; 13; 17; 19
2.2 Even numbers: 8; 10; 12; 14
2.3 Multiples of 6: 6; 12; 18; 24; 30; 36
2.4 Counting numbers 0; 1; 2; 3; 4; 5; 6
2.5 Factors of 24: 1; 2; 3; 4; 6; 8; 12; 24
3.1 15
3.2 12
3.3 10
3.4 5

1.15.6 LEARNER SECTION

1.15.6.1 Content

1.15.6.2 Activity: To recognise and represent numbers in order to describe and compare them [LO 1.3.6, LO 1.3.7]

1. At the beginning of Grade 5 (Module 1) we looked thoroughly at multiples, factors and prime numbers. Do you remember what each of these is? Let us revise!

   Explain the difference between a multiple, a factor and a prime number to a friend:

15 This content is available online at <http://cnx.org/content/m20022/1.1/>. 
1.15.6.2.1 NOTE!

Multiples of 5 = 5 ; 10 ; 15 ; 20 ; etc.
We count in fives
Factors can be divided exactly into a number.
The factors of 12 = 1 ; 2 ; 3 ; 4 ; 6 ; 12
A prime number has only two different factors,
e.g. The factors of 2: 2 and 1
The factors of 3: 3 and 1
The factors of 5: 5 and 1

1.15.6.2.2 DO YOU REMEMBER?

You can use the constant function of your pocket calculator to calculate the multiples of a number. E.g. for the multiples of 4, key in:
\[ 4 + + + + + + = \]

- Use your pocket calculator to determine the multiples of 13, 15 and 24.

2. Draw lines to show which descriptions in column A match with numbers in column B:

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Prime numbers</td>
<td>8 ; 10 ; 12 ; 14</td>
</tr>
<tr>
<td>2.2 Even numbers</td>
<td>1 ; 2 ; 3 ; 4 ; 6 ; 8 ; 12 ; 24</td>
</tr>
<tr>
<td>2.3 Multiples of 6</td>
<td>0 ; 1 ; 2 ; 3 ; 4 ; 5 ; 6</td>
</tr>
<tr>
<td>2.4 Counting numbers</td>
<td>11 ; 13 ; 17 ; 19</td>
</tr>
<tr>
<td>2.5 Factors of 24</td>
<td>6 ; 12 ; 18 ; 24 ; 30 ; 36</td>
</tr>
</tbody>
</table>

Table 1.14

3. Work with a friend to solve the following puzzle:
1.15.6.2.3 WHAT NUMBER AM I?

Figure 1.5

I lie between 30 and 60. I am a multiple of 11 and I am an even number.

Figure 1.6

I am a factor of 12. I am an even number and also a multiple of 3. I am greater than 7.
Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

- **1.3.6:** multiples and factors of at least any 2-digit and 3-digit whole number;
- **1.3.7:** prime numbers to at least 100.
1.16 To recognise and represent numbers in order to describe and compare them\textsuperscript{16}

1.16.1 MATHEMATICS

1.16.2 Number Concept

1.16.3

1.16.4 EDUCATOR SECTION

1.16.5 Memorandum

- no
- yes
- yes

1.4 yes

1.16.6 LEANER SECTION

1.16.6.1 Content

1.16.6.2 ACTIVITY: To recognise and represent numbers in order to describe and compare them [LO 1.3.1]

1.16.6.3 PALINDROME:

1.16.6.3.1 Did you know?

A palindrome is a number which can be read forwards and backwards, e.g. 343 en 1221

1. Are the following numbers palindromes?

1.1 123421

1.2 46064

1.3 1328231

1.4 43499434

1.16.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.1: whole numbers to at least 9-digit numbers.

\textsuperscript{16}This content is available online at <http://cnx.org/content/m20042/1.1/>. 
1.17 (Untitled) To recognise and represent numbers in order to describe and compare them\(^{17}\)

1.17.1 MATHEMATICS

1.17.2 Number Concept

1.17.3

1.17.4 EDUCATOR SECTION

1.17.5 Memorandum

1. Answers of learners may differ
   2. Plus and minus
   3. Answers of learners may differ
   4. Multiply and divide
   5.1 0
   5.2 0
   5.3 34
   5.4 k
   5.5 c
   5.6 does not change

1.17.6 LEARNER SECTION

1.17.6.1 Content

1.17.6.2 ACTIVITY: To recognise and represent numbers in order to describe and compare them [LO 1.3.4]

1.17.6.3 To determine output values for given input values [LO 2.3.2]

1. Do you remember the following? In Grade 5 (Module 2) we looked at the rules for multiplying and dividing by 0 and 1. Let us look at the properties of 0 and 1:
   Fill in any number on the left and complete the flow diagram.

\(^{17}\)This content is available online at <http://cnx.org/content/m20043/1.1/>. 
2. Tell a friend which calculations with 0 do NOT change the value of a number.

1.7.6.3.1 NOTE!

Dividing with 0 is not allowed. We say that dividing by 0 is undefined.

3. Once again, fill in numbers on the left and complete the flow diagrams:
Figure 1.13

Figure 1.14
3.4
4. Tell a friend which calculations with 1 do NOT change the value of a number.
5. Now calculate:
5.1 \(148 \times 0 \times 236 = \)
5.2 \(0, 36 = \)
5.3 \(34, 1 \times 1 = \)
5.4 \(k + 0 = \)
5.5 \(c, 0 = \)
• \(58, 0 = \)

1.17.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.4: 0 in terms of its additive property.
1.18 To calculate by selecting appropriate operations for solving problems\(^{18}\)

1.18.1 MATHEMATICS

1.18.2 Number Concept

1.18.3

1.18.4 EDUCATOR SECTION

1.18.5 Memorandum

1.15
1.2 3
1.3 8
1.4 6
2.1 \((39 \times 27) + 496\) 1 549
2.2 \((23 \times 18) + 852 - 256\) 1 010
2.3 \((67 + 48); 7 705 \div \text{answer 67}\)
2.4 \(3 600 \div 30; 82 \times 10; \text{answer} + \text{answer 940}\)
2.5 \(2 934 - 816 + 905 - 205 2 818\)

---

Figure 1.16

---

\(^{18}\)This content is available online at <http://cnx.org/content/m20044/1.1/>. 
1.18.6 2. Different solutions are possible. You are aloud to use a number more than once.

Test 1

- 13 800; 13 750
- 24 360; 24 375

2. 300 000 + 60 000 + 8 000 + 400 + 20 + 9

- <
- =

- 20 500
- 358 490

5. six million eight hundred twenty three thousand four hundred and seventeen

6.1 1296
6.2 6

- 40 000
- 6 million

- 37 000
- 149 000

- 48; 56; 64; 72
- 1; 2; 3; 4; 5; 6; 8; 12; 24
- 11; 13; 17; 19

10.1 true

- false
- false

- 114
- 34
- 70

11.4 6

1.18.7 LEANER SECTION

1.18.7.1 Content

1.18.7.2 ACTIVITY: To calculate by selecting appropriate operations for solving problems [LO 1.8.10]

It is very important to really understand and remember the following; otherwise you will not be able to perform easy (or difficult) operations, so that you will get wrong answers!

SEQUENCE OF CALCULATIONS TAKE NOTE AND LEARN THE FOLLOWING!

The order in which calculations are done is:
1. Brackets  
2. Of  
3. Division  
4. Multiplication  
5. Addition  
6. Subtraction  
The following rules are also applicable:  
1. When the operation is + only or x only, e.g. 6 + 3 + 9 + 5: work from LEFT TO RIGHT.  
2. When there is only + and −, e.g. 6 − 3 + 2 − 4 + 9: work from LEFT TO RIGHT  
Thus: 6 − 3 à 3 + 2 à 5 − 4 à 1 + 9 = 10  
3. When you only have x and ÷, is, e.g. 2 x 24 , 4 x 10 , 5: Work from LEFT TO RIGHT  
Thus: 2 x 24 à 48 , 4 à 12 x 10 à 120 , 5 = 24  
1. Let’s see if you are able to apply the preceding knowledge correctly. Work with a partner and calculate the following:  
1.1 \( f = 9 + 6 \) \( − \) 2 − 7  
1.2 \( c = 7 − (18 + 2) \) \( ÷ \) 5  
1.3 \( k = 23 − 16 + 4 \) \( − \) 3  
1.4 \( e = 36 \) \( ÷ \) 12 x 4 \( ÷ \) 2  
You may use your pocket calculator now, but it might not help if you do not know the correct sequence of operations. If you are uncertain, read the previous page again. Try to complete the following table correctly:  

<table>
<thead>
<tr>
<th>Calculate</th>
<th>Key to sequence</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.g. 15 + 6 ( \times ) 2</td>
<td>( (6 \times 2) + 15 )</td>
<td>27</td>
</tr>
<tr>
<td>2.1 496 + 39 ( \times ) 27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 852 + ( (23 \times 18) ) − 256</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 7 705 [U+F0B8] (67 + 48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 3 600 [U+F0B8] 30 + 82 ( \times ) 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 2 934 − 816 ÷ 905 − 205</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.15  

1.18.7.2.1 TIME FOR PEER-ASSESSMENT  
How well do you know the last part of the work that we have been doing? Explain the following to a partner. Your partner can then assess you by circling the relevant code:  

<table>
<thead>
<tr>
<th>Altogether unsure</th>
<th>Not very sure</th>
<th>Fairly sure</th>
<th>Very sure</th>
</tr>
</thead>
</table>

continued on next page
<table>
<thead>
<tr>
<th>I can explain what multiples are. (LO 1.3)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can explain what factors are. (LO 1.3)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can explain what prime numbers are. (LO 1.3)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can use the constant function on my pocket calculator to determine multiples. (LO 1.8)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can explain what a palindrome is. (LO 1.3)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can explain the properties of 1 and 0 to my friend. (LO 1.3)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I know the sequence of calculations and can apply it correctly. (LO 1.8)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1.16

1.18.7.2.2 PUZZLES!

1. Place the numbers 1 to 9 in the diagram in such a way that all the number sentences are true.
2. Place numbers between 1 and 12 in the diagram in such a way that the sum totals of the different sides are the same.
1.18.7.2.3 TEST 1

1. Complete the following number patterns:
   1.1 13 850 ; ________________ ; ________________ ; 13 700 ; 13 650
   1.2 24 330 ; 24 345 ; ________________ ; ________________ (4)

2. Write in expanded notation:
   2.1 368 429 = ________________ + ________________ + ________________ + ________________ +

   (2)

3. Fill in: $< ; >$ or $=$:
   3.1 $489 653 \times 498 653$ _________________
   3.2 $10 \times 10 \times 10 \times 10 \times 100 000 \times 10$ _________________
4. Which number is:
4.1 350 more than 20150? ________________________
4.2 10000 less than 368490? ______________________

5. Write in words:
6832419

6. Complete:
6.1 64 = ________________________
6.2 one million = $1 \times 10^6$ ________________________

7. What is the value of the digit printed in bold?
7.1 147689 ________________________
7.2 6823417 ________________________

8. Round off to the nearest 1000:
8.1 36842 ________________________
8.2 149099 ________________________

9. Write down:
9.1 the multiple of 8 between 40 and 80

9.2 the factors of 24

9.3 the prime numbers between 10 and 20

10. True or False?
10.1 42624 is a palindrome ________________________
10.2 1 is a prime number ________________________
10.3 36 , 0 = 0 ________________________

11. Calculate:
11.1 $90 + 6 \times 12 ,, 3$ ________________________
11.2 $36 - (5 \times 4), 10$ ________________________
11.3 $80 - 6 + 4 - 13 + 5$ ________________________
11.4 $8 \times 5 ,, 8 \times 6 ,, 5$ ________________________

I got ________________________ out of 35 right.

I feel

<table>
<thead>
<tr>
<th>VERY SATISFIED</th>
<th>HAPPY</th>
<th>CONCERNED</th>
<th>I AM ABLE TO DO BETTER</th>
</tr>
</thead>
</table>

Table 1.17
1.18.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.10: multiple operations on whole numbers with or without brackets.

1.19 To perform mental calculations$^{19}$

1.19.1 MATHEMATICS

1.19.2 Number Concept

1.19.3 EDUCATOR SECTION

1.19.4 Memorandum

1. 62; 63
   2.19
   2.2132
   2.317
   2.4331
   2.5498
   2.668.5
   2.71000
   2.8144
   2.9+
   2.1010
   2.1163
   2.12176
   2.137
   2.144
   2.15450

1.19.5 LEANER SECTION

1.19.5.1 Content

1.19.5.2 ACTIVITY: To perform mental calculations [LO 1.9.1]

1. See how many figures you can find in this garden and then add them together. If you work cleverly you will be able to calculate the answers in a flash! Are you able to see how?

$^{19}$This content is available online at <http://cnx.org/content/m20045/1.1/>.
What is your answer? __________________________________________________

2. Now we are going to test your mental calculation skills in a different way. If you know your multiplication tables and can also add and subtract well, you will not have any trouble. Try to complete these within three minutes:

2.1 ___________ x 8 = 72
2.2 ___________ ÷ 11 = 12
2.3 119 + ___________ = 136
2.4 ___________ - 214 = 117
2.5 Double 249: ________________
2.6 Halve 137: __________________
2.7 30 x _______________ = 30 000
2.8 4 x 3 x 12 = ______________
2.9 567 _______________ 23 = 590
2.10 8 670 ÷ _______________ = 867
2.11 (5 x 9) + 18 = ______________
2.12 (7 + 15) x 8 = ______________
2.13 (42 ÷ ______________) + 14 = 20
2.14 (5 x ________________) - 9 = 11
2.15 Halve x _________________ = 225

Complete by colouring in the appropriate block:

<table>
<thead>
<tr>
<th>I did</th>
<th>WELL</th>
<th>AVERAGE</th>
<th>POORLY</th>
</tr>
</thead>
</table>

Table 1.18

1.19.5.2.1 DO YOU STILL REMEMBER?

The answer to an addition sum is called the SUM.

Thus: 4 873 + 2 168 = 7 041
addend  addend  sum
3. Some more mental calculation!
Calculate the answers without using a calculator. Use the code and complete the following sentence:
Subtraction is called the ________________________________ of addition.
3.1 27 + 35
3.2 48 + 16
3.3 53 + 19
3.4 23 + 37
3.5 39 + 17
3.6 15 + 24
3.7 26 + 34

<table>
<thead>
<tr>
<th>I</th>
<th>A</th>
<th>N</th>
<th>K</th>
<th>V</th>
<th>O</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>74</td>
<td>64</td>
<td>102</td>
<td>72</td>
<td>88</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 1.19

<table>
<thead>
<tr>
<th>B</th>
<th>R</th>
<th>Y</th>
<th>S</th>
<th>P</th>
<th>M</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>56</td>
<td>20</td>
<td>39</td>
<td>99</td>
<td>52</td>
<td>32</td>
</tr>
</tbody>
</table>

Table 1.20

We can also say that subtraction is the inverse operation of addition. I can test an addition sum by subtracting.

1.19.6 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.1: addition and subtraction.

1.20 To calculate by selecting operations appropriate to solving problems

1.20.1 MATHEMATICS

1.20.2 Number Concept

1.20.3 EDUCATOR SECTION

1.20.4 Memorandum

1.1 3 272 + 128 = 3 400
1 154 + 136 = 1 290
1 103 + 97 = 1 200
SUM = 5 890
1.2 138 + 622 = 760

20This content is available online at <http://cnx.org/content/m20047/1.1/>. 
259 + 11 011 = 11 270
235 + 25 = 4 260
SUM: = 16 290
2.1 Wrong: 640 + 360 + 5 + 2 - 2 = 1 005
2.2 Wrong: 2 500 + 360 = 2 880
Brain Teaser
1. 41 186 + 23 880 + 12 = 65 078
2. 758 817 + 100 + 118 200 - 4 = 875 113
Various other possibilities

1.20.5 LEANER SECTION

1.20.5.1 Content

1.20.5.2 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.2]

1.20.5.2.1 DO YOU STILL REMEMBER?

Addition is easier when we GROUP numbers.

Look carefully at the following example:
37 + 28 + 12 + 13 + 44
If we group the numbers they look like this: 37 + 13 = 50
28 + 12 = 40
44 + 16 = 60
SUM = 150
Understand? We group the numbers like this because we want to “complete” the tens, so that it is easier to add.

1. Group the following numbers so that you can add them more easily:
1.1 3 272 ; 1 154 ; 97 ; 128 ; 136 ; 1 103
_________________ + _________________ = _________________
_________________ + _________________ = _________________
_________________ + _________________ = _________________
SUM = _________________
1.2 138 ; 259 ; 4 235 ; 25 ; 11 011 ; 622
_________________ + _________________ = _________________
_________________ + _________________ = _________________
_________________ + _________________ = _________________
SUM = _________________

2. Work with a friend and determine whether the answers of the following calculations are correct. If they are not, indicate the error.
2.1 638 + 367 = 640 + 360 - 5 = 995
2.2 2 496 + 364 = 2 600 + 360 = 2 960

1.20.5.2.2 BRAIN TEASER!

You are supposed to complete the following with a calculator, but the 9 on your calculator doesn’t work!
How will you solve the problem? Write down everything you key in and calculate the answer:
1. 41 186 + 23 892

_________________ + _________________ = _________________

2. 756 917 + 118 196
CHAPTER 1. TERM 1

1.20.5.2.3 TIME FOR SELF-ASSESSMENT

How do you feel about the work so far? Please give us some indication of how you feel about the work that we have completed by now. Make a tick in the appropriate column:

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Fairly well</th>
<th>Well</th>
<th>Really well</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know what “sum of” means.</td>
<td>_________</td>
<td>_________</td>
<td>_______</td>
<td>_________</td>
</tr>
<tr>
<td>I can explain the word “inverse”.</td>
<td>_________</td>
<td>_________</td>
<td>_______</td>
<td>_________</td>
</tr>
<tr>
<td>I can group numbers to add them more easily. (LO1.8)</td>
<td>_________</td>
<td>_________</td>
<td>_______</td>
<td>_________</td>
</tr>
</tbody>
</table>

Table 1.21

1.20.6 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers.

1.21 To recognise and use the properties of addition\(^{21}\)

1.21.1 MATHEMATICS

1.21.2 Number Concept

1.21.3 EDUCATOR SECTION

1.21.4 Memorandum

1.1 True

1.2 True

1.3 True

2.1 2 236 994

2.2 1 198 235 + 469 203

2.3 264 059 = 1 269 055

\(^{21}\)This content is available online at <http://cnx.org/content/m20048/1.1/>. 
1.21.5 LEARNER SECTION

1.21.5.1 Content

1.21.5.2 ACTIVITY: To recognise and use the properties of addition [LO 1.12.2]

1. Do you still remember this? In grade 5 (Module 1) we looked at the properties of addition. Now you must use this knowledge!

Work with one of your friends and decide whether the following are true or false. You may use your pocket calculator:

1.1 \[2 \, 623 \, 896 + 2 \, 346 \, 213 = 2 \, 346 \, 213 + 2 \, 623 \, 896\]

1.2 \[54 \, 236 + (28 \, 912 + 46 \, 852) = (54 \, 236 + 28 \, 912) + 46 \, 852\]

1.3 \[(128 \, 435 + 239 \, 416) + 1 \, 379 \, 538 = 128 \, 435 + (239 \, 416 + 1 \, 379 \, 538)\]

2. Complete the following without a calculator by filling in the missing numbers:

2.1 \[456 \, 213 + \_ = 2 \, 346 \, 994 + 456 \, 213\]

2.2 \[1 \, 198 \, 235 + (469 \, 203 + 2 \, 069 \, 523) = (\_ + \_) + 2 \, 069 \, 523\]

2.3 \[(264 \, 059 + 3 \, 016 \, 438) + 1 \, 269 \, 055 = \_ + (3 \, 016 \, 438 + \_)\]

1.21.6 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.12:** We know this when the learner recognises, describes and uses:

1.12.2: the commutative, associative and distributive properties with whole numbers (the expectation is that learners should be able to use the properties and not necessarily know the names).

1.22 To perform mental calculations

1.22.1 MATHEMATICS

1.22.2 Number Concept

1.22.3 EDUCATOR SECTION

1.22.4 Memorandum

1.1 6
1.2 12
1.3 775
1.4 9
1.5 11
1.6 3700
1.7 9 rem 3
1.8 6 rem 5
1.9 6248
1.10 504
1.11 350
1.12 45

---

This content is available online at <http://cnx.org/content/m20049/1.1/>. 
1.13 8
1.14 19 000
1.15 1 rem 16

1.22.5 LEANER SECTION

1.22.5.1 Content

1.22.5.2 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. By this time you will have realised how important it is to develop a quick mind and do without a pencil and paper. Answer the following questions as quickly and accurately as possible and see whether you are able to improve on the results of your previous mental calculation test:

1.1 \[ \frac{54}{9} = \ldots \]

1.2 \[ \ldots \times 8 = 96 \]

1.3 \[ 5 000 - 4 225 = \ldots \]

1.4 \[ (7 \times \ldots) + 9 = 70 \]

1.5 \[ (9 \times 5) - \ldots = 34 \]

1.6 \[ 2 575 + 1 125 = \ldots \]

1.7 \[ \frac{84}{9} = \ldots \]

1.8 \[ \frac{53}{8} = \ldots \]

1.9 Double 3 124: \ldots

1.10 Halve 1 008: \ldots

1.11 250 + 75 + 25 = \ldots

1.12 \[ (12 \times 12) - \ldots = 99 \]

1.13 \[ (42 + \ldots) \times 1 000 = 50 000 \]

1.14 Round off to the nearest 1 000: 19 450: \ldots

1.15 \[ (9 \times 12) \div 92 = \ldots \]

Complete: I have \ldots correct!

<table>
<thead>
<tr>
<th>My marks have</th>
<th>Dropped</th>
<th>Remained the same</th>
<th>Improved</th>
</tr>
</thead>
</table>

Table 1.22

1.22.6 Assessment

**Learning Outcome 1**: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9**: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction;

1.9.2: multiplication of whole numbers to at least 12 x 12.
1.23 To solve problems in context

1.23.1 MATHEMATICS

1.23.2 Number Concept

1.23.3 EDUCATOR SECTION

1.23.4 Memorandum

1.23.5 LEANER SECTION

1.23.5.1 Content

1.23.5.2 ACTIVITY: To solve problems in context [LO 1.6.1/2]

1.23.5.3 To use a range of techniques to perform calculations [LO 1.10.1/5]

1.23.5.4 To use a range of strategies to check solutions [LO 1.11]

In the previous activity you practised your mental skills. On the other hand it is also important to be able to calculate correctly by using pencil and paper. Form groups of three. Your teacher will provide the paper you need. Then execute the following assignments neatly and accurately.

1. Solve the following problems:
   1.1 Mr Dlamini has won a competition and would like to buy each of his three sons a house. He sees the following advertisements:
   House A: R895 000
   House B: R795 799
   House C: R799 495
   What will the three houses cost Mr Dlamini?
   1.2 Nancy sees an exhibition of dinosaurs in a museum. The weights of the three dinosaurs are given as follows:
   A: 45 875 kg
   B: 9 324 kg
   C: 26 879 kg
   What is the combined weight of the dinosaurs?
   1.3 The registration figures for the “Long-winded Marathon” are as follows:
   2002: 24 513
   2003: 31 687
   2004: 42 196
   How many entries have there been in the marathon up to now?

2. Check your answers using your pocket calculator.

3. Explain to the class how your group has arrived at the answers.

4. Compare your methods with those of the other groups. How do they differ?

1.23.5.4.1 TIME FOR GROUP ASSESSMENT

Assess your work on a scale of 1 – 4 and circle the appropriate number

1 = needs more attention
2 = fairly good
3 = very good
4 = excellent

---

23This content is available online at <http://cnx.org/content/m20052/1.1/>. 
Criteria: Needs attention Fairly good Very good Excellent

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>All group members participated in the activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Group members listened to each other.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Group members helped and encouraged each other.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Group members adhered to the instructions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Each one had a chance to speak.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The group’s work was neatly done.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The answers were calculated correctly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1.23

1.23.6 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

1.6.2: measurements in Natural Sciences and Technology contexts.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.1: adding, subtracting and multiplying in columns;

1.10.5: using a calculator.

**Assessment Standard 1.11:** We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.
1.24 To determine the equivalence and validity of different representations\(^{24}\)

1.24.1 MATHEMATICS

1.24.2 Number Concept

1.24.3 EDUCATOR SECTION

1.24.4 Memorandum

2. Learner’s own method
   3.1 9 080 717
   3.2 8 301 883

   • 6 485 185

1.24.4.1 Brain Teaser

1. 4 2 1
   3 2
   1 3
   2 3
   1 44
   8 1

1.24.5 LEARNER SECTION

1.24.5.1 Content

1.24.5.2 ACTIVITY: To determine the equivalence and validity of different representations [LO 2.6.3]

1.24.5.3 To use strategies to check solutions [LO 1.11]

1. In the previous activity you had the opportunity to use your own strategies to solve problems. From the feedback in the class you would have realised that there are many ways of adding numbers.

   Work in pairs. Discuss the following methods of adding and explain to each other how the answers are calculated:

1.24.5.3.1 LET’S REVISE!

1.1 845 908 + 25 876 + 343 621

\[
\begin{array}{ccccccc}
800 000 & + & 40 000 & + & 5 000 & + & 900 & + & 0 & + & 8 \\
\bf{20 000} & + & \bf{5 000} & + & \bf{800} & + & 70 & + & 6 \\
+ & 300 000 & + & 40 000 & + & 3 000 & + & 600 & + & 20 & + & 1 \\
\bf{1 100 000} & + & \bf{100 000} & + & \bf{13 000} & + & \bf{2 300} & + & 90 & + & 15 \\
\end{array}
\]

Table 1.24

\(^{24}\)This content is available online at <http://cnx.org/content/m20054/1.1/>. 
\[ = 1\,000\,000 + (100\,000 + 100\,000) + 10\,000 + (3\,000 + 5\,000) + 300 + (90 + 10) + 5 \]
\[ = 1\,215\,405 \]

**Figure 1.20**

\[
\begin{array}{cccccc}
100\,000 & + & 10\,000 & + & 2\,000 & + & 100 & + & 10 & + & 8 \\
80\,000 & + & 40\,000 & + & 5\,000 & + & 900 & + & 0 & + & 6 \\
20\,000 & + & 5\,000 & + & 800 & + & 70 & + & 6 & \\
300\,000 & + & 40\,000 & + & 3\,000 & + & 600 & + & 20 & + & 1 \\
\hline
1\,200\,000 & + & 1\,10\,000 & + & 1\,5\,000 & + & 2\,400 & + & 100 & + & 15
\end{array}
\]

**Table 1.25**

\begin{center}
\begin{tabular}{cccccc}
1 & 1 & 1 & 2 & 1 & 1 \\
8 & 4 & 5 & 9 & 0 & 8 \\
2 & 5 & 8 & 7 & 6 & \\
+ & 3 & 4 & 3 & 6 & 2 & 1 \\
1 & 2 & 1 & 5 & 4 & 0 & 5 \\
\end{tabular}
\end{center}

2. Can you show your friend any other method of calculation?

3. Use any method of your choice (without a calculator) and calculate the sum of:

\[ 3\,1\,4\,6\,2\,3\,5\,7\,7 + 1\,2\,3\,9\,2\,4\,6 + 3\,2\,1\,7\,8\,9\,4 \]
3.2 \[2851416 + 4981235 + 469232\]

3.3 \[2159892 + 264058 + 4067235\]

1.24.5.3.2 BRAIN TEASERS!

Complete the missing numbers:

1. | 2 | 1 | 3 | 4 | 1 | ___ | 2. | ___ | 7 | 9 | 1 | 2 | 3 |
---|---|---|---|---|---|---|---|---|---|---|---|---|---|
   | 8 | 9 | 2 | ___ | 7 |   | 4 | ___ | 2 | 8 | 1 | 6 |   |
   | 1 | 7 | 5 | ___ | 9 | 2 |   | 1 | 1 | ___ | 2 | 3 | 3 |   |
   | ___ | 1 | 4 | 1 | 1 | 9 |   | 1 | 0 | 0 | ___ | 7 | 1 |   |
   | + | 1 | ___ | 9 | 1 | 2 | 3 |   | + | 1 | 4 | 3 | 0 | ___ | ___ |
   | ___ | 1 | ___ | 0 | 8 | 5 |   | 9 | 5 | 8 | 5 | 8 | 7 |   |

Table 1.26

1.24.5.4 TIME FOR SELF-ASSESSMENT

- Tick the appropriate rectangle:

<table>
<thead>
<tr>
<th>Yes</th>
<th>Mostly</th>
<th>Some-times</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can investigate adding methods and evaluate them (determine whether they are correct). (LO 1.11 en LO 2.6)</td>
<td>*</td>
<td>continued on next page</td>
<td></td>
</tr>
</tbody>
</table>
I can add correctly without a calculator. (LU 1.8)

I need more exercise in addition.

Table 1.27

* Ask your educator to explain again and give you extra exercises.

1.24.6 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.11:** We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 2.6:** We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

2.6.3: e.g. number sentences.

1.25 To solve problems in context25

1.25.1 MATHEMATICS

1.25.2 Number Concept

1.25.3 EDUCATOR SECTION

1.25.4 Memorandum

1.1 12 November 2001
5 November 2001
1.2 R94.98
1.3 10
1.4 14%
14%
1.5 maps
Cash
1.6 Anneke
1.7 R25.00
1.8 820:14
15:30

- Cashier 101
- No payment

2. R9 + R12 + R9 + R4 + R2 + R4 = R40
3.1 1 litre full cream milk

25 This content is available online at <http://cnx.org/content/m20055/1.1/>. 
• kg chicken pieces
• litre Coke

410 g Surf maid peas
200 g Niknaks
5 litre Vanilla ice cream
1 Sasko Sam bread

3.2 Prices will vary from shop to shop
3.3 Calculate according to prices in 3.2
3.4 Calculate according to prices in 3.3

1.25.5 LEANER SECTION

1.25.5.1 Content

1.25.5.2 ACTIVITY: To solve problems in context [LO 1.6.1]

When we buy something in a shop we receive a cash slip. We need to be able to understand and “read” the slip. If not, we will not be able to check if it really reflects what we have bought and paid for. Look at the following examples:

![Cash Slip Example]

Table 1.28

1. Study the above examples and then answer the following questions:

1.1 When were the purchases made at
Pick ’n Pay? ____________________________________________________
Ranch Meat Centre? ______________________________________________

1.2 What does the biltong cost per kg? ________________________________

1.3 How many items were bought from Pick ’n Pay? ______________________

1.4 What % tax had to be paid at
Pick ’n Pay? ____________________________________________________
Ranch Meat Centre? ______________________________________________

1.5 How (with what) did the client pay at
Pick ’n Pay? ____________________________________________________
Ranch Meat Centre? _____________________________________________
1.6 Who was the cashier at Ranch Meat Centre? __________________________
1.7 What amount did the customer give her? _____________________________
1.8 At what time were the purchases made at Pick’n Pay? __________________
Ranch Meat Centre? _____________________________________________
1.9 If your purchases are not according to the slip, how will you know which cashier helped you at Pick’n Pay if you cannot remember what he/she looked like?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
1.10 What does the * next to a few of the amounts on the Pick’n Pay slip mean?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.25.5.2.1 DO YOU STILL REMEMBER?

Explain to a friend how we round off to the nearest 10, 100 and 1 000.
** Can you explain how we would round off to the nearest 10 000?
2. When we go shopping, we can estimate to the nearest rand whether we will have enough money to pay.

Look at the following slip. Round off to the nearest rand and estimate how much you will have to pay for your shopping.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAMB</td>
<td>0.360 Kg</td>
<td>R9.35</td>
</tr>
<tr>
<td>LAMB</td>
<td>0.444 Kg</td>
<td>R11.54</td>
</tr>
<tr>
<td>SWEET CORN</td>
<td></td>
<td>R8.79</td>
</tr>
<tr>
<td>SQUASH</td>
<td>1.295 Kg</td>
<td>R4.26</td>
</tr>
<tr>
<td>SWEET POTATOES</td>
<td>0.686 Kg</td>
<td>R2.05</td>
</tr>
<tr>
<td>GOOD MORNING H</td>
<td></td>
<td>R3.79</td>
</tr>
<tr>
<td>COOKED HAM</td>
<td></td>
<td>R12.95</td>
</tr>
</tbody>
</table>
Table 1.29

3. Confused Cathy’s shopping list is completely wrong!
3.1 Write the shopping list down correctly.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

3.2 Find out what each item will cost at your nearest supermarket and write it down.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

3.3 Use your calculator and calculate what this shopping will cost you.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

3.4 If you pay with a R100 note, how much change will you get?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.25.5.2.2 DO YOU STILL REMEMBER?

Your calculator has a memory that you can use to do calculations with more than one operation correctly.
M+ : enables the calculator to save or memorise the answer
MR / RCM : these keys are pressed if you want to retrieve the memorised answers
e.g. (347 219 + 34 987) + (296 533 + 1 897 320)
Key in 347 219 + 34 987 = M+
Then key in 296 533 + 1 897 320 = M+
Then key in MR or RCM

1.25.6 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).
1.26 To use a range of techniques for performing calculations\textsuperscript{26}

1.26.1 MATHEMATICS

1.26.2 Number Concept

1.26.3 EDUCATOR SECTION

1.26.4 Memorandum

1. Amount will vary according to size of the learner’s family and the age of the children in the family.
   
   Brain Teaser
   
   $233 + 27 - 53 + 29 - 41 + 13 - 18 = 190$

1.26.5 LEANER SECTION

1.26.5.1 Content

1.26.5.2 Activity: To use a range of techniques for performing calculations [LO1.10.5]

1. Study the notice and then answer the questions that follow. You may use your calculator. (Remember the memory keys!)

\textsuperscript{26}This content is available online at <http://cnx.org/content/m20056/1.1/>. 
• What amount will your father have to pay if your family stays one night at “Suzie’s Accommodation”?
• You eat dinner and breakfast before leaving again.
• Explain how you calculated your answer!

---

Figure 1.21

---
**1.26.5.2.1 TIME FOR SELF-ASSESSMENT**

It is important for us to know how you feel about the work that we have completed. Consider the criteria and colour the block that reflects how you feel.

I can “analyse” a till slip and answer questions about it correctly.

<table>
<thead>
<tr>
<th>I can “analyse” a till slip and answer questions about it correctly.</th>
<th>Not at all</th>
<th>Fairly well</th>
<th>Well</th>
<th>Really well</th>
</tr>
</thead>
</table>

I can use the memory keys on the calculator correctly.

<table>
<thead>
<tr>
<th>I can use the memory keys on the calculator correctly.</th>
<th>Not at all</th>
<th>Fairly well</th>
<th>Well</th>
<th>Really well</th>
</tr>
</thead>
</table>

I was able to calculate the amount of the family’s accommodation correctly.

<table>
<thead>
<tr>
<th>I was able to calculate the amount of the family’s accommodation correctly.</th>
<th>Not at all</th>
<th>Fairly well</th>
<th>Well</th>
<th>Really well</th>
</tr>
</thead>
</table>

Table 1.30

**1.26.5.2.2 BRAIN TEASER!**

Vusi is a passenger on a ferry. He notes that at the first stop 18 people get on and 13 get off. At the next stop 41 people get on and 29 get off. At the third stop 53 people get on and 27 get off. If there were then 233 people left on the ferry, how many people were on the ferry when Vusi got on?

__________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________
__________________________________________________________________________________________________________________________________________

**1.26.6 Assessment**

*Learning Outcome 1*: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

*Assessment Standard 1.10*: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1. **1.10.5**: Using a calculator.
1.27 To solve problems in context\textsuperscript{27}

1.27.1 MATHEMATICS

1.27.2 Number Concept

1.27.3

1.27.4 EDUCATOR SECTION

1.27.5 Memorandum

1.27.6 TEST 2

1. 1.1 Sum
1.2 Subtraction
2. 2.1 True

- True

3. 2 \(382 + 12\ 018 = 14\ 400\)
4 \(214 + 45\ 116 = 49\ 330\)
= 63 730
4. 4.1 1 143 269
4.2 5 261 380 + 43 826
5.1 R13 + R54 + R8 + R130 = R205
5.2 R204.32
6. 7 637 261
7.1 8 035 933
7.2 8 621 704

1.27.7 LEANER SECTION

1.27.7.1 Content

1.27.7.2 Activity: To solve problems in context [LO1.6.1]

**This is a task for your portfolio – do it without your pocket calculator! Be sure that you really understand what you have to do. Consider the assessment criteria before you start! Ask your educator for the paper that you will need:

1. Page through the local newspaper and find three advertisements that offer houses for sale. The prices should all be more than one million rand. Cut out the advertisements neatly and paste them on your sheet of paper. Calculate the combined price of the three houses.

2. Page through the newspaper again to find three examples of flats that are for sale. Also cut these out neatly and paste them on your paper. Calculate the combined price of the most expensive and the least expensive flats.

3. Now look for examples of three cars that are for sale. These must also be cut out and pasted neatly. Calculate the combined cost of the three cars.

4. Now select one house or flat and one car and calculate what you will have to pay for these items.

1.27.7.2.1 ASSESSMENT: NEWSPAPER-RELATED ACTIVITY

\textsuperscript{27}This content is available online at \textcolor{blue}{<http://cnx.org/content/m20060/1.1/>}.


table 1.31

1.27.8 TEST

1. Fill in the missing words:
   1.1 The answer of an addition sum is called the ___________________________.
   1.2 __________________________ is the inverse of addition. (2)

2. True / False:
   2.1 27 more than 12 849 is 12 876.
   2.2 869 213 is 9 100 more than 860 113. (2)

3. Calculate the answers to the following by grouping the numbers:
   2382 + 4214 + 12018 + 45116

   _____________________ + ___________________ = _____________________
   _____________________ + ___________________ = _____________________

   = _____________________ (5)

4. Fill in the missing numbers:
   4.1 123 896 + 1143 269 = _____________________ + 123 896
   4.2 5261 380 + (43826 + 45793) = (___________________ +

   _____________________ ) + 45793 (3)

5. Nancy is shopping and packs the following items in her basket:
   Mini tea cookies - R 12,69
   Meat - R 54,29
   Cheese - R 7,84
   Frying pan - R 129,50

5.1 Calculate how much money she needs by rounding off to the nearest rand.

   __________________________________________________
   __________________________________________________
   __________________________________________________
   __________________________________________________
   (5)

5.2 Calculate the exact amount that she has to pay:

   __________________________________________________
   __________________________________________________
   __________________________________________________
   __________________________________________________

(2)
6. Ebrahim had to calculate the following: $4167809 + 3469452$. He forgot to complete the sum. Now do it on his behalf:

$$
\begin{array}{cccccc}
4 & 1 & 6 & 7 & 8 & 0 & 9 \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
+ & 3 & 4 & 6 & 9 & 4 & 5 & 2 \\
\hline
7 & \_ & \_ & \_ & \_ & 6 & \_ & \_ & \_ & (2)
\end{array}
$$

7. Calculate the following by using the shortest method possible:

7.1 $4138269 + 3897664$

$$
\begin{array}{cccccc}
4 & 1 & 3 & 8 & 2 & 6 & 9 \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
+ & 3 & 8 & 9 & 7 & 6 & 6 & 4 \\
\hline
7 & 0 & 2 & 6 & 9 & 9 & 6 & 3 & (2)
\end{array}
$$

7.2 $5963287 + 2658417$

$$
\begin{array}{cccccc}
5 & 9 & 6 & 3 & 2 & 8 & 7 \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
+ & 2 & 6 & 5 & 8 & 4 & 1 & 7 \\
\hline
8 & 6 & 2 & 1 & 7 & 3 & 9 & 4 & (2)
\end{array}
$$

- Complete by colouring in the appropriate block:

I am

<table>
<thead>
<tr>
<th>COMPLETELY READY</th>
<th>NOT QUITE READY YET</th>
<th>NOT READY AT ALL</th>
</tr>
</thead>
</table>

---

Table 1.32

to advance to the next Learning Unit.

1.27.9 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).
1.28 To perform mental calculations\(^{28}\)

1.28.1 MATHEMATICS

1.28.2 Subtraction

1.28.3

1.28.4 EDUCATOR SECTION

1.28.5 Memorandum

1. Let’s review

Difference

Addition

- Do you remember

Only 2 factors have/can only be divided by 1 and itself.

Always divisible by 2.

1. 13 - 7 5. 91 - 3
2. 31 - 3 6. 97 - 7
3. 53 - 5 7. 59 - 7
4. 71 - 11

1.28.6 LEARNER SECTION

1.28.6.1 Content

1.28.6.2 Activity: To perform mental calculations [LO 1.9.1]

1. How accurately can you still subtract? The grid contains a hidden number. Use the clues to colour in the blocks that will reveal the number.

1.1 14 - 9
1.2 17 - 8
1.3 21 - 7
1.4 23 - 6
1.5 20 - 12
1.6 42 - 13
1.7 45 - 18
1.8 39 - 16
1.9 34 - 15
1.10 104 - 7

\(^{28}\text{This content is available online at <http://cnx.org/content/m20063/1.1/>}.\)
1.11 106 – 8  
1.12 103 – 8  
1.13 101 – 5

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>12</th>
<th>106</th>
<th>8</th>
<th>18</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>66</td>
<td>70</td>
<td>21</td>
<td>5</td>
<td></td>
<td>63</td>
</tr>
<tr>
<td>101</td>
<td>12</td>
<td>50</td>
<td>14</td>
<td>117</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>73</td>
<td>9</td>
<td>109</td>
<td>68</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>98</td>
<td>86</td>
<td>29</td>
<td>22</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>95</td>
<td>38</td>
<td>17</td>
<td>8</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>71</td>
<td>11</td>
<td>95</td>
<td>83</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Table 1.33

1.28.6.3 What is the hidden number? ___________________________________________

2. More fun!

   You must now think carefully. Do you still remember what the “inverse” of subtraction is? This may help us find the answer to subtraction sums quickly. Work with a partner and see who is the first one to identify the figure that is hidden behind each cloud!
1.28.6.3.1 Let’s revise!

- Do you still remember?

The answer to a subtraction sum is called the ___.

The inverse of subtraction is ___.

1.28.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction.
1.29 To calculate by selecting operations appropriate to solving problems

1.29.1 MATHEMATICS

1.29.2 Subtraction

1.29.3

1.29.4 EDUCATOR SECTION

1.29.5 Memorandum

1.29.6 LEANER SECTION

1.29.6.1 Content

1.29.6.2 Activity: To calculate by selecting operations appropriate to solving problems [LO 1.8.1]

1. It is still important to remember how to round off numbers, because this is a method that you may be able to use to quickly calculate the difference.

1.1 Work with a partner to determine the difference, by rounding off both numbers to the nearest 10. Take turns to give the answers.

a) 276 - 95
b) 415 - 109
c) 647 - 142
d) 999 - 351

2. Can you calculate the difference between the following numbers quicker than your partner? First round off the numbers to the nearest 100.

2.1 1 325 - 876
2.2 3 764 - 1 321
2.3 6 009 - 4 245
2.4 9 999 - 7 908

How well do you remember?

Complete the following:

A prime number is a number that ____________________________________________________________________________

______________________________________________________________________________________________

An even number is ____________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

1.29.6.3 Brainteaser!

Two prime numbers can be subtracted to give an even number as answer, e.g. 19 - 5 = 14

Can you find the correct prime numbers to make the following number sentences true?

1. __________________ - __________________ = 6
2. __________________ - __________________ = 28
3. __________________ - __________________ = 48
4. __________________ - __________________ = 60
5. 88 = __________________ - __________________
6. 90 = __________________ - __________________

29 This content is available online at <http://cnx.org/content/m20071/1.1/>.
7. $52 = \underline{\hspace{2cm}} - \underline{\hspace{2cm}}$

1.29.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000.

1.30 To perform mental calculations

1.30.1 MATHEMATICS

1.30.2 Subtraction

1.30.3

1.30.4 EDUCATOR SECTION

1.30.5 Memorandum

1.30.6 LEANER SECTION

1.30.6.1 Content

1.30.6.2 Activity: To perform mental calculations [LO 1.9.1, LO 1.9.2]

1. Until now your mental calculation skills have been of cardinal importance to the activities. This is another opportunity to improve these skills further. Let us see how well you perform in the following mental calculation test. Work as quickly and accurately as possible.

- $1.1 \underline{\hspace{2cm}} \times 9 = 72$
- $1.2 \underline{\hspace{2cm}} \div 11 = 12$
- $1.3 119 + \underline{\hspace{2cm}} = 136$
- $1.4 \underline{\hspace{2cm}} - 213 = 117$
- $1.5 30 \times \underline{\hspace{2cm}} = 3000$
- $1.6 967 \underline{\hspace{2cm}} = 990$
- $1.7 86 700 \underline{\hspace{2cm}} = 867$
- $1.8 (4 \times 9) + 18 = \underline{\hspace{2cm}}$
- $1.9 (7 + 15) \times 8 = \underline{\hspace{2cm}}$
- $1.10 (42 \underline{\hspace{2cm}} + 14 = 20$
- $1.11 (5 \underline{\hspace{2cm}} - 9 = 11$
- $1.12 \text{ Half} \times \underline{\hspace{2cm}} = 225$

---

30This content is available online at <http://cnx.org/content/m20072/1.1/>.
1.13 Double: 359: _____________________
1.14 Halve: 437: _____________________
1.15 104 = _____________________
Complete: I have answered _______________________________ correctly!

1.30.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1: addition and subtraction;
1.9.2: multiplication of whole numbers to at least 12 x 12.

1.31 To describe and illustrate number systems that differ from our own

1.31.1 MATHEMATICS

1.31.2 Subtraction

1.31.3

1.31.4 EDUCATOR SECTION

1.31.5 Memorandum

1. Before Christ
   2. 5502 / (will be +1 each year)
   3.
   3.1 900 000
   3.2 9 000
   3.3 999 900
   3.4 0 990
   3.5 990 000

1.31.6 LEARNER SECTION

1.31.6.1 Content

1.31.6.1.1 Activity: To describe and illustrate number systems that differ from our own [LO 1.2]

Did you know?

The Egyptians used pictograms to represent numbers as long ago as 3500 B.C. Pictograms looked like these:

31This content is available online at <http://cnx.org/content/m20073/1.1/>. 
1. What does B.C. mean?

2. How many years ago was this?

3. Calculate the following. Use contemporary digits for your answers.

3.1

3.2
TIME FOR SELF-ASSESSMENT
Let’s see how well you are managing. Read the criteria and place a tick in the appropriate block:

<table>
<thead>
<tr>
<th>I know what the answer to a subtraction sum is called.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>___________</td>
<td>___________</td>
<td>___________</td>
<td>___________</td>
</tr>
</tbody>
</table>

*continued on next page*
I can calculate differences by rounding off to the nearest 10 and 100 (LO 1.8)  

| I know what a prime number is (LO 1.3) | _______ | _______ | _______ | _______ |
| I know what an even number is (LO 1.3) | _______ | _______ | _______ | _______ |
| I understand the Egyptian pictograms and can use them to subtract (LO 1.2) | _______ | _______ | _______ | _______ |

Table 1.34

1.31.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.2:** We know this when the learner describes and illustrates written number systems different to own.

1.32 To determine the equivalence and validity of different methods

1.32.1 MATHEMATICS

1.32.2 Subtraction

1.32.3

1.32.4 EDUCATOR SECTION

1.32.5 Memorandum

1.1 378 767
1.2 366 269
1.3 613 751

1.32.6 LEARNER SECTION

1.32.6.1 Content

1.32.6.1.1 Activity: To determine the equivalence and validity of different methods [LO 2.6.3]

1.32.6.1.2 To use strategies to check solutions [LO 1.11]

1. In the previous activity you saw a variety of methods to do computations. Let’s have a look at further ways of finding the difference. Divide into groups of three. Read through the following problem carefully.

---

32This content is available online at <http://cnx.org/content/m20079/1.1/>. 
Your educator will allocate numbers to the groups and indicate which solution each group should look at. First discuss the solution and then explain it to the rest of the class.

What is the subtrahend if the minuend is 631 524 and the difference is 254 637?

1. I subtract by counting backwards:
   631 524 - 254 637
   631 524 - 200 000
   • 431 524 - 50 000
   • 381 524 - 4 000
   • 77 524 - 600
   • 376 924 - 30
   • 376 894 - 7

   = 376 887
   The subtrahend is 376 887.

1.2 I use the rule of compensation for subtraction.
   631 524 - 254 637
   + 363 + 363
   • 631 887 - 255 000
   + 5 000 + 5 000
   • 636 887 - 260 000

   376 887
   • I work with negative numbers and write them as follows:

   |   |   |
   | 631 524 | 254 637 |
   |   |   |
   | -3 | (4 - 7) |
   | -10 | (20 - 30) |
   | -100 | (500 - 600) |
   | -3 000 | (1 000 - 4 000) |
   | -20 000 | (30 000 - 50 000) |
   | 400 000 | (600 000 - 200 000) |
   | 376 887 | (400 000 - 20 000 - 3 000 - 100 - 10 - 3) |

   Table 1.35

1.4 This is a short method for determining the subtrahend:

5 12 10 14 11 14
6 3 1 5 2 4
-2 5 4 6 3 7
3 7 6 8 8 7

1.5. Can your group think of another method for calculating the answer?

_____________________________________________________________________
_____________________________________________________________________
2. Which of these methods do YOU prefer?

Why?

1.32.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

Learning Outcome 2: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 2.6: We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

1.33 To calculate by choosing methods that are appropriate for solving problem

1.33.1 MATHEMATICS

1.33.2 Subtraction

1.33.3

1.33.4 EDUCATOR SECTION

1.33.5 Memorandum

1.33.6 LEARNER SECTION

1.33.6.1 Content

1.33.6.1.1 Activity: To calculate by choosing methods that are appropriate for solving problem [LO 1.8.1]

1. You have already been exposed to a variety of methods for doing subtraction. Now you have to see whether you are able to use your accumulated knowledge meaningfully. Calculate the following, using whatever method you prefer:

1.1 721 435 − 342 668

This content is available online at <http://cnx.org/content/m20080/1.1/>. 
1.2 834 206 – 467 937

1.3 1 000 000 – 386 249

2. Check your answers by using a pocket calculator.

1.33.6.1.2 TIME FOR SELF-ASSESSMENT

Let’s see how you are doing! Indicate how you feel about the different methods of subtraction. Colour the faces that reflect your feelings.

<table>
<thead>
<tr>
<th></th>
<th>Help!</th>
<th>Struggling</th>
<th>Almost coping</th>
<th>No problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can subtract by counting backwards (LO 1.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use the rule of compensation for subtraction correctly (LO 1.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know how to subtract with negative numbers (LO 1.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use the short method for subtraction (LO 1.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.36

1.33.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000.
1.34 To perform mental calculations

1.34.1 MATHEMATICS

1.34.2 Subtraction

1.34.3

1.34.4 EDUCATOR SECTION

1.34.5 Memorandum

1.1 15
1.2 33
1.3 93
1.4 995
1.5 99 997
1.6 99 995
1.7 130
1.8 3 650
1.9 53
1.10 612 ½
1.11 123
1.12 12
1.13 19
1.14 6
1.15 ½
Puzzle out old code
1 286 1 335
- 539 - 934
1. 101

1.34.6 LEARNER SECTION

1.34.6.1 Content

1.34.6.1.1 Activity: To perform mental calculations [LO 1.9.1]

1. During the previous activities you have worked with very large numbers. It is equally important to be able to subtract small numbers correctly. Let us see how you will manage the following mental calculations test! Work as quickly and accurately as possible:

1.1 31 - 16 =
1.2 52 - 19 =
1.3 101 - 8 =
1.4 1 004 - 9 =
1.5 10 003 - 6 =
1.6 100 002 - 7 =
1.7 240 - 50 - 60 =
1.8 4 000 - 350 =
1.9 (530 \times 10) + 100 =
1.10 Halve 1 225: 

34 This content is available online at <http://cnx.org/content/m20083/1.1/>. 
1.11 Triple: ________________________________________________________
1.12 \((11 \times 12) - \) ___________________________________________________________________ \(= 120\)
1.13 \(100 - (9 \times 9) = \) ___________________________________________________________________ 
1.14 \((38 - \) ___________________________________________________________________) \(\div 4 = 8\)
1.15 \(\) ___________________________________________________________________ \(\times 850 = 425\)

Colour in: This time I have done GOOD AVERAGE POOR.

1.34.6.1.2 Decipher the code!
Each letter represents a digit. Can you discover the numbers?

<table>
<thead>
<tr>
<th>ROAD</th>
<th>_______________</th>
<th>DEEP</th>
<th>_______________</th>
</tr>
</thead>
<tbody>
<tr>
<td>- HIS</td>
<td>_______________</td>
<td>- HER</td>
<td>_______________</td>
</tr>
<tr>
<td>EWE</td>
<td>_______________</td>
<td>ROD</td>
<td>_______________</td>
</tr>
</tbody>
</table>

Table 1.37

Do you know that this kind of mathematics is called Alpha-mathematics?

1.34.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.1: addition and subtraction.

1.35 To solve problems in context\(^{35}\)

1.35.1 MATHEMATICS
1.35.2 Subtraction
1.35.3
1.35.4 EDUCATOR SECTION
1.35.5 Memorandum
1.35.6 LEANER SECTION

1.35.6.1 Content
1.35.6.1.1 Activity: To solve problems in context [LO 1.6.1]
1.35.6.1.2 To use a range of techniques to perform calculations [LO 1.8.2]

Being observant, I’m sure that you will have seen that we deal with a lot of ‘subtractions’ in our daily lives! Consider the following carefully:

Here we have a list of things that you may also have at home.
1. Find two prices for each item in the local newspaper. Write down the highest price. Then calculate the difference between the two prices. (You may use your pocket calculator).

\(^{35}\)This content is available online at <http://cnx.org/content/m20084/1.1/>. 
1. How much will you save if you pay price 2 instead of price 1 for all the items?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

3. Ask your partner to check your answers.

1.36.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.1: rounding off to the nearest 5, 10, 100 or 1 000

1.36 To solve problems in context

1.36.1 MATHEMATICS

1.36.2 Subtraction

1.36.3

1.36.4 EDUCATOR SECTION

1.36.5 Memorandum

1.36.6 LEARNER SECTION

1.36.6.1 Content

1.36.6.1.1 Activity 3.10 To solve problems in context [LO 1.6.1]

1.36.6.1.2 To use a range of techniques to perform calculations [LO 1.8.2]

1. CHALLENGE!

---

This content is available online at <http://cnx.org/content/m20086/1.1/>.
Choose any five items / articles that you are able to buy in a shop (they do not necessarily have to be groceries).

Write down what each item / article costs. You can cut out the pictures in the newspaper and paste it. Work neatly. Talk to your grandparents or any other older person about what the price was when they were children. Calculate how much more expensive it is now.

<table>
<thead>
<tr>
<th>ITEM / ARTICLE</th>
<th>PRESENT PRICE</th>
<th>PRICE THEN</th>
<th>DIFFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>--------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>a.</td>
<td>--------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>a.</td>
<td>--------------</td>
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</tr>
<tr>
<td>a.</td>
<td>--------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>a.</td>
<td>--------------</td>
<td>------------</td>
<td>------------</td>
</tr>
</tbody>
</table>

Table 1.39

2. ANOTHER CHALLENGE!
Arrange a class discussion and find answers to the following:
2.1 What is a budget?
2.2 Must families have a budget?
2.3 Do YOU have a budget according to which you spend your pocket money? If so, tell the class about it.

1.36.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers.
1.37 To solve problems in context

1.37.1 MATHEMATICS

1.37.2 Subtraction

1.37.3

1.37.4 EDUCATOR SECTION

1.37.5 Memorandum

1.37.6 LEARNER SECTION

1.37.6.1 Content

1.37.6.1.1 Activity 3.11 To solve problems in context [LO 1.6.1]

1.37.6.1.2 To use a range of techniques to perform calculations [LO 1.8.2]

* * This is a task for your portfolio. You have been talking about a budget. Now answer the following questions. Work as neatly as you can, but first find out how this task is going to be assessed.

To find out at home:
1. Do your parents make use of a monthly budget?
2. Make a list of everything for which your parents need to budget each month.

3. What is the biggest monthly expense for your family?

4. What amount do your parents budget for groceries each month (approximately - you may round off the amount)

5. What is the difference between this amount and the amount that your parents must pay monthly for your school fees?

6. How much do you think a family of four (two adults and two teenage children) should budget for entertainment (cinema and eating out, etc.) each month?
   Explain your answer.

7. Prepare a budget for YOURSELF for the next month (i.e. how much money you need and what for)

8. How much money will you have left to save if you received R300,00 pocket money per month?

1.37.6.1.3 ASSESSMENT: BUDGET

³³This content is available online at <http://cnx.org/content/m20089/1.1/>. 
<table>
<thead>
<tr>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completeness</td>
<td>Hardly any of the instructions have been carried out.</td>
<td>Half of the instructions have been carried out.</td>
<td>One or two instructions have not been completed.</td>
<td>All instructions have been completed.</td>
</tr>
<tr>
<td>Neatness and organisation</td>
<td>The work is untidy and unorganised.</td>
<td>The work is organised but difficult to read.</td>
<td>Neat and organised, legible.</td>
<td>Neat, clearly set out, clearly legible work.</td>
</tr>
<tr>
<td>Correctness of calculations</td>
<td>All the calculations are incorrect.</td>
<td>There are many mistakes.</td>
<td>A few mistakes occur.</td>
<td>All answers are correctly calculated.</td>
</tr>
</tbody>
</table>

Table 1.40

1.37.7 TEST

1. What numbers are needed to ensure that the total in each direction is 47?

Figure 1.29

(3)

2. Provide the answers to the following without doing any written calculations:

2.1 $975 - 325 = \underline{650}$

2.2 $1050 - \underline{\underline{102}} = \underline{948}$

2.3 $103 - \underline{102} = \underline{1}$ (3)

3. True or False?

3.1 The difference between 7 000 and 3 628 is 3 372

3.2 25 less than 18 500 is 18 275

4. Ebrahim had to calculate the following: $130 000 - 27 864$
He did it as follows:
His calculation is incorrect. Circle each mistake. (2)
5. Correct Ebrahim’s sum.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
(2)
6. Reduce 408 276 by 129 479.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
(4)
7. What will the subtrahend be if the minuend is 5 346 200 and the difference is 1 326 408?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
(4)

1.37.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:
1.8.2: addition and subtraction of whole numbers.
Chapter 2

Term 2

2.1 To perform mental calculations

2.1.1 MATHEMATICS

2.1.2 Multiplication

2.1.3 EDUCATOR SECTION

2.1.4 Memorandum

1. Addition
   Multiplier

2.1.4.1 Product

2.1.4.2 Multiplicand

Factors
   Multiples
   1 x 3 786; 2 x 1 893; 6 x 631; 631 x 6
   BRAIN TEASERS
   3 786 3 786 x 1; 1 893 x 2
   3 x 1 262; 1 262 x 3
   1 x 8 742; 8 742 x 1; 6 x 1 457; 1 457 x 6
   8 742 2 x 4 371; 4 371 x 2
   3 x 2 914; 2 914 x 3

2.1.5 LEARNER SECTION

2.1.6 Content

2.1.6.1 Activity: To perform mental calculations [LO 1.9.2]

1. How well do you know your 12 × table? Count in 12’s and colour each answer in green.
   If you do this correctly you will find the answer to the following:
   Multiplication is actually repeated

\footnote{This content is available online at \texttt{<http://cnx.org/content/m20929/1.1/>}.}
Table 2.1

<table>
<thead>
<tr>
<th></th>
<th>12</th>
<th>14</th>
<th>34</th>
<th>41</th>
<th>68</th>
<th>70</th>
<th>82</th>
<th>100</th>
<th>109</th>
<th>124</th>
<th>131</th>
<th>142</th>
<th>150</th>
<th>197</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>W</td>
<td>V</td>
<td>F</td>
<td>H</td>
<td>O</td>
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<td>G</td>
<td>X</td>
<td>H</td>
<td>B</td>
<td>E</td>
<td>T</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>D</td>
<td>D</td>
<td>T</td>
<td>I</td>
<td>U</td>
<td>N</td>
<td>A</td>
<td>Z</td>
<td>R</td>
<td>D</td>
<td>O</td>
<td>R</td>
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<tr>
<td>M</td>
<td>Y</td>
<td>R</td>
<td>I</td>
<td>E</td>
<td>J</td>
<td>O</td>
<td>I</td>
<td>C</td>
<td>T</td>
<td>K</td>
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<td>A</td>
<td>V</td>
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<td>T</td>
<td>B</td>
<td>T</td>
<td>I</td>
<td>Y</td>
<td>D</td>
<td>H</td>
<td>S</td>
<td>W</td>
<td>F</td>
<td>L</td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

- Can you find any more multiples of 12? Colour them in blue.

What word does your answer spell? _______________________________________

2. LET US REVISE!

Fill in the missing answer:

In 24 x 17 = 408, we call:

- 17 the_ ___________________________________________________________
- 408 the_ ___________________________________________________________
- 24 the_ ___________________________________________________________
- 24 and 17_ _______________________________________________________
- of 408_ ___________________________________________________________
- of 17_ ___________________________________________________________

2.1.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.2: multiplication of whole numbers to at least 12 x 12.

2.2 To recognise, classify and represent numbers²

2.2.1 MATHEMATICS

2.2.2 Multiplication

2.2.3 EDUCATOR SECTION

2.2.4 Memorandum

1.4 9 12 888

15

18

1 476 195 361

No matter in which order you multiply – answer remains the same.

²This content is available online at <http://cnx.org/content/m20930/1.1/>.
2.2.5 LEANER SECTION

2.2.6 Content

2.2.6.1 Activity: To recognise, classify and represent numbers [LO 1.3.6]

1. MORE REVISION!
   How many factors can you write down for each product?

<table>
<thead>
<tr>
<th>E.g. 12</th>
<th>$12 \times 1$</th>
<th>1.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 × 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 × 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 × 3</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>6 × 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 × 12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2

<table>
<thead>
<tr>
<th>1.2</th>
<th>1.3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.3

BRAIN-TEASER!

Find the following factors (you may use your calculator, if necessary):

a) 3 786

b) 8 742

1.4 Complete with a friend to see whose answers are written down first:

$9 \times 7 = 7 \times \underline{\phantom{00000}}$

$716 \times 18 = \underline{\phantom{00000}}$

$\underline{\phantom{00000}} \times 16 = 16 \times 15$

$18 \times 716 = 12 888$
\[324 \times \underline{\phantom{000}} = 18 \times 324\]

\[563 \div 347 = 195 \quad 361\]

\[1476 \times 326 = 326 \times \underline{\phantom{000}}\]

\[347 \times 536 = \underline{\phantom{00000}}\]

- What do you realise?

DID YOU KNOW?
We call the above the **COMMUTATIVE PROPERTY** of multiplication.

DID YOU ALSO KNOW?
The **ASSOCIATIVE PROPERTY** of multiplication looks like this:

\[(6 \times 5) \times 2 = 6 \times (2 \times 5)\]

\[2 \times (3 \times 4) = (2 \times 3) \times 4\]

Thus, it makes no difference how we **GROUP** the numbers because the answer stays the same.

### 2.2.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.3:** We know this when the learner recognises and represents the following numbers in order to describe and compare them:

- **1.3.6:** multiples and factors of at least any 2-digit and 3-digit whole number.

### 2.3 To recognise, describe and use the properties of whole numbers\(^3\)

#### 2.3.1 MATHEMATICS

#### 2.3.2 Multiplication

#### 2.3.3

#### 2.3.4 EDUCATOR SECTION

**Memorandum**

1. 17

1. \(x\ 19\)

63

72

Something else to know.

50

1. \(+\ 15 = 50\)

2. (a) \(20 + 7\)

(b) \(500 + 30\)

500 30 94

\(^3\)This content is available online at [http://cnx.org/content/m20932/1.1/].
### 2.3.5 BRAIN TEASERS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[U+F0D6] X</td>
<td>[U+F0D6] X</td>
<td></td>
</tr>
<tr>
<td>[U+F0D6] X</td>
<td>[U+F0D6] X</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.4

1.4 Dolphin

### 2.3.6 LEANER SECTION

### 2.3.7 Content

#### 2.3.7.1 Activity: To recognise, describe and use the properties of whole numbers [LO 1.12.2]

1. Take another look at the properties of multiplication that you have studied. Now complete the following:

   - \( 17 \times (15 \times 13) = (_________________________ \times 15) \times 13 \)
   - \( (246 \times 38) \times 19 = 246 \times (_________________________ \times __________________) \)
   - \( (349 \times \underline{_________________________}) \times 68 = 72 \times (349 \times 68) \)
   - SOMETHING MORE TO KNOW!
   - The **DISTRIBUTIVE PROPERTY** of multiplication makes it much easier to calculate the product.
   - Calculate the answer to the following:
     - \( (7 + 3) \times 5 = \underline{_________________________} \)
     - \( (7 \times 5) + (3 \times 5) = \underline{_________________________} + \underline{_________________________} = \underline{_________________________} \)
   - Thus: \( (7 + 3) \times 5 = (7 \times 5) + (3 \times 5) \)
   - 2. Work together with a friend and fill in the missing answers:
     - a) \( 68 \times 27 = 68 \times (\underline{_________________________} + \underline{_________________________}) \)
     - b) \( 94 \times 536 = 94 \times (\underline{_________________________} + \underline{_________________________} + 6) \)
     - \( = (94 \times \underline{_________________________}) + (94 \times \underline{_________________________}) + \underline{_________________________} \times \underline{_________________________} \)

#### BRAIN-TEASER!

4 Can you complete the following table by filling in a tick (P) or a cross (O)?

<table>
<thead>
<tr>
<th>Property</th>
<th>can be applied to multiplication</th>
<th>can be applied to division</th>
<th>can be applied to addition</th>
<th>can be applied to subtraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commutative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.5

#### 2.3.7.1.1 TIME FOR SELF-ASSESSMENT
- Tick the applicable block:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know the 12x-table. (LO 1.9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know the terminology (product, multiple, factors, multiplier, etc.) and can use it properly. (LO 1.12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can determine factors of numbers correctly. (LO 1.3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can apply the commutative property of multiplication. (LO 1.12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can apply the associative property of multiplication. (LO 1.12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can apply the distributive property of multiplication. (LO 1.12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.6

2.3.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.12:** We know this when the learner recognises, describes and uses:

1.12.2: the commutative, associative and distributive properties with whole numbers.
2.4 To perform mental calculations

2.4.1 MATHEMATICS

2.4.2 Multiplication

2.4.3

2.4.4 EDUCATOR SECTION

Memorandum

2.4.5 LEARNER SECTION

2.4.5.1 Content

2.4.5.1.1 Activity: To perform mental calculations [LO 1.9.2]

1. Let us see if you still know your other tables. Something or someone is hidden away. Find the answers of the following and colour the blocks in. When you have discovered what it is, write the answer down:

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

Figure 2.1

1.19 x 4
1.26 x 7
1.35 x 9
1.412 x 6
1.57 x 9
1.63 x 8
1.76 x 9
1.811 x 12
1.98 x 7
1.1012 x 8
1.117 x 5
1.126 x 8
1.1312 x 12
1.149 x 8
1.1512 x 9
15

4This content is available online at <http://cnx.org/content/m20936/1.1/>.
DO YOU STILL REMEMBER?
10 = 10 x 1
100 = 10 x 10
1 000 = 10 x 10 x 10
10 000 = 10 x 10 x 10 x 10
100 000 = 10 x 10 x 10 x 10 x 10
1 000 000 = 10 x 10 x 10 x 10 x 10 x 10
DO YOU ALSO REMEMBER?
We can write the number in a shorter way by using the POWERS OF TEN.
10 = 10^1 (10 to the power of 1)
100 = 10^2 (10 to the power of 2)
1 000 = 10^3
10 000 = 10^4
100 000 = 10^5
1 000 000 = 10^6

2.4.6 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.2: multiplication of whole numbers to at least 12 x 12.

2.5 To determine output values for given input values\(^5\)

2.5.1 MATHEMATICS

2.5.2 Multiplication

2.5.3 EDUCATOR SECTION

Memorandum

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>7</td>
<td></td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td></td>
<td>3 200</td>
</tr>
<tr>
<td></td>
<td>236</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>986</td>
<td></td>
<td>98 600</td>
</tr>
<tr>
<td></td>
<td>4614</td>
<td></td>
<td>461 400</td>
</tr>
</tbody>
</table>

Table 2.7

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>6</td>
<td></td>
<td>6 000</td>
</tr>
</tbody>
</table>

\(^5\)This content is available online at <http://cnx.org/content/m20937/1.1/>.
<table>
<thead>
<tr>
<th>27</th>
<th>× 10³</th>
<th>27000</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td></td>
<td>53000</td>
</tr>
<tr>
<td>719</td>
<td></td>
<td>719000</td>
</tr>
<tr>
<td>894</td>
<td></td>
<td>894000</td>
</tr>
</tbody>
</table>

Table 2.8

<table>
<thead>
<tr>
<th>1.3</th>
<th>4</th>
<th>10³</th>
<th>400000</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td></td>
<td></td>
<td>1900000</td>
</tr>
<tr>
<td>236</td>
<td></td>
<td></td>
<td>2360000</td>
</tr>
</tbody>
</table>

Table 2.9

2.1 20000 + 9000 = 29000
2.2 160000 + 1200 = 158800
2.3 700000 = 4000000 + 4700000
2.4 8000000 + 1600000 = 7840000

2.5.4 LEANER SECTION

2.5.5 Content

2.5.5.1 Activity: To determine output values for given input values [LO 2.3.2]

1. Let us see whether you are able to apply your knowledge of powers of 10 correctly. Complete the following flow diagrams:

![Flow diagram](image-url)
CHAPTER 2. TERM 2

2. Work together with a friend and calculate:
2.1 \((2 \times 10^4) + (9 \times 10^3) = \) ____________ + ____________ = ____________
2.2 \((16 \times 10^4) + (12 \times 10^2) = \) ____________ + ____________ = ____________
2.3 \((7 \times 10^9) + (4 \times 10^6) = \) ____________ + ____________ = ____________
2.4 \((8 \times 10^9) + (16 \times 10^4) = \) ____________ + ____________ = ____________

3. Check your answers with a calculator.
CAN YOU STILL REMEMBER?
Explain to a friend how you can programme a calculator to multiply in powers of 10.

2.5.6 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.
Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.2: flow diagrams.

2.6 To use a range of techniques to perform calculations

2.6.1 MATHEMATICS

2.6.2 Multiplication

2.6.3 EDUCATOR SECTION

2.6.4 Memorandum

1. 150; 1 500; 15 000; 150 000; 1 500 000; 15 000 000; 1.500 000 E
2. Screen too small for answer.
3. Error
4. 4.13

• 5
• 7

5.1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.10

5.2

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>500</td>
<td>125</td>
</tr>
<tr>
<td>800</td>
<td>200</td>
</tr>
<tr>
<td>1 200</td>
<td>300</td>
</tr>
</tbody>
</table>

Table 2.11

6. Answer remains the same.

---

6This content is available online at <http://cnx.org/content/m20953/1.1/>. 
2.6.5 LEARNER SECTION

2.6.6 Content

2.6.6.1 Activity: To use a range of techniques to perform calculations [LO 1.10.5]

2.6.6.2 To determine output values for given input values [LO 2.3.1, LO 2.3.3]

Were you able to explain how to programme a pocket calculator? If not, ask a friend to help you. Answer the following questions if you understand how to do the programming.

1. Key in: 10 x 15 = = = =
   Write down your answers each time: ______________________________________
   ______________________________________________________________________

2. Why does your calculator eventually say 15 000 000 E? _________________
   ______________________________________________________________________

3. What does the E stand for? ________________________________________

4. Complete the following:
   4.1 346 x 1 000 = 346 x 100
   4.2 346 x 100 000 = 346 x 1000
   4.3 346 x 1 000 000 = 346 x 10000

5. Complete the following tables:

<table>
<thead>
<tr>
<th>5.1</th>
<th>1 x 25</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 x 25</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5 x 25</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8 x 25</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>12 x 25</td>
<td></td>
</tr>
</tbody>
</table>

   Table 2.12

<table>
<thead>
<tr>
<th>5.2</th>
<th>1 x 100</th>
<th>100</th>
<th>[U+F0B8] 4</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 x 100</td>
<td></td>
<td>[U+F0B8] 4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5 x 100</td>
<td></td>
<td>[U+F0B8] 4</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8 x 100</td>
<td></td>
<td>[U+F0B8] 4</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>12 x 100</td>
<td></td>
<td>[U+F0B8] 4</td>
<td></td>
</tr>
</tbody>
</table>

   Table 2.13

6. What do you realise when you look at the answers of these two tables?

   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

2.6.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.
Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.5: using a calculator.

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.1: verbal descriptions.

2.7 To use a range of techniques to perform calculations

2.7.1 MATHEMATICS

2.7.2 Multiplication

2.7.3 EDUCATOR SECTION

2.7.4 Memorandum

1.1 9 x 25 ÷ (9 x 100) ÷ 4
2. 1 368 x 25 ÷ (368 x 100) ÷ 4
1.3 16 x 25 ÷ (16 x 100) ÷ 4
2. 2 400 ÷ 4
32 400 ÷ 4
8 100
2.2 1 436 x 100) ÷ 4
1 43 600 ÷ 4
35 900
2.3 26 844 ÷ (26 844 x 100) ÷ 4
2 684 400 ÷ 4
671 100

2.7.5 BRAIN TEASERS

yes

÷ 1 436 ÷ 4) x 100
359 x 100
35 900
3 1

| 3 7 5 |
| 6 2 5 |
| 1 1 2 5 |

Table 2.14

3 2

This content is available online at <http://cnx.org/content/m20969/1.1/>. 
Table 2.15

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3 000</td>
<td></td>
<td>375</td>
</tr>
<tr>
<td>5 000</td>
<td></td>
<td>625</td>
</tr>
<tr>
<td>9 000</td>
<td></td>
<td>1 125</td>
</tr>
</tbody>
</table>

4. Answer the same.
5. 1 000
8
divide
8
1 000
multiplication
6.1 36 x 1 000 1 056 000 ÷ 8
36 000 132 000
6.2 132 x 1 000 ÷ 1 056 x 1 000 ÷ 8
132 000 132 000

2.7.6 BRAIN TEASERS
x 1 000 [U+F0B8] 2 / x 5 x 100 / 2 x 1 000

2.7.7 LEARNER SECTION

2.7.8 Content

2.7.8.1 Activity: To use a range of techniques to perform calculations [LO 1.1.0.3]

2.7.8.2 To determine output values for given input values [LO 2.3.3]

It is very important to develop strategies for arriving at answers quickly to make life easier in Grade 6. Let us take a look at some bright ideas to use when we do multiplication!

REMEMBER!
When you multiply by 25 you can first multiply by 100 and then divide by 4!
1. Can you balance the following scales by filling in the correct number?

1.1

Figure 2.5
2. Use the above method to calculate:

2.1 324 \times 25 =

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

2.2 1436 \times 25 =

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

2.3 26844 \times 25 =

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

BRAIN-TEASER!
Can I also first divide by 4 and then multiply by 100? _________________________
Prove your answer!

1 436 \times 25 =

_____________________________________________________________________
_____________________________________________________________________

3. Look carefully at the following example and then complete the tables:
4. Compare the answers in the tables. What do you realise?

5. Complete the following:
REMEMBER:
If I have to multiply by \( 125 \) I can first multiply by \________\ and then \________\ the answer I get by \________\.

OR I can first divide the number by \________\ and then \________\ the answer by \________\.

6. See if you can apply this method!
6.1 \( 288 \times 125 = \div 288 \) \( [U+F0B8] 8 \) \( \times 1000 \)

= \________\ = \________\ = \________\

or

\( 288 \times 125 = \div (288 \times 1000) \div 8 \)

= \________\ = \________\ = \________\

6.2 \( 1056 \times 125 = \div (1056 \div 8) \times 1000 \) or \________\ = \________\ = \________\

BRAIN-TEASER!
WITHOUT using a calculator, how would you multiply a number by \( 500 \) in two seconds?

2.7.9 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.3: building up and breaking down numbers.

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.
Assessment Standard 2.3: We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.3: tables.

2.8 To perform mental calculations

2.8.1 MATHEMATICS

2.8.2 Multiplication

2.8.3 EDUCATOR SECTION

2.8.4 Memorandum

1.1 6
1.2 96
1.3 150
1.4 500
1.5 12
1.6 42
1.7 5
1.8 1 000 000
1.9 9 900
1.10 63 000
1.11 524
1.12 66
1.13 100
1.14 578
1.15 768½ / 768,5

2.8.5 LEARNER SECTION

2.8.6 Content

2.8.6.1 Activity: To perform mental calculations [LO 1.9.2]

If you have attended well during the previous activities, the following mental calculation test should be child’s play! Let us see how well you manage.

1. Complete the following:
   1.1 ____________________ x 9 = 54
   1.2 ____________________ ÷ 8 = 12
   1.3 6 x 25 = ____________________
   1.4 4 x 125 = ____________________
   1.5 6 x ____________________ = 72
   1.6 45 ÷ ____________________ = 7
   1.7 106 = ____________________
   1.8 104 - 102 = ____________________
   1.9 63 x 103 = ____________________
   1.10 (5 x 102) + (6 x 4) = ____________________
   1.11 (13 x 6) - (4 x 3) = ____________________

*This content is available online at <http://cnx.org/content/m20972/1.1/>.
1.12 \(105 \div 103 = \) ____________________  
1.13 Double: 289: ____________________  
1.14 Halve: 1 337: ____________________  

- Colour in the applicable block:

| I had | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | correct! |

Table 2.18

2.8.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.2: multiplication of whole numbers to at least 12 x 12.

2.9 To solve problems in context\(^9\)

2.9.1 MATHEMATICS

2.9.2 Multiplication

2.9.3 EDUCATOR SECTION

2.9.4 Memorandum

2.9.5 LEARNER SECTION

2.9.6 Content

2.9.6.1 Activity: To solve problems in context [LO 1.6]

2.9.6.2 To use a range of techniques to perform calculations [LO 1.10.1, LO 1.10.5]

1. Divide into groups of three. Ask your educator for the required sheets of paper and calculate the following answers WITHOUT making use of a pocket calculator:

1.1 The Johnny family’s telephone account comes to approximately R376 each month. More or less how much will they have to pay for a year’s use of the telephone?  
1.2 Mr Naidoo drives 795 km each month for his work. What is the distance that he covers in a year and a half?  
1.3 The Grade 7s are going on a tour and each learner has to pay R499. What is the total amount that the 78 learners will have to pay?  
1.4 The "Ride Safely" taxi group transports passengers to a soccer match in Johannesburg, at R245 per passenger. What is the total amount that will be paid if 837 spectators make use of their service?  
1.5 An elephant calf weighs 932 kg. How much will 348 elephant calves weigh?  
2. Check your answers with the help of a pocket calculator.  
3. Explain how you calculated your answers to the rest of the class.  
4. Compare the different methods. How do they differ?

\(^9\)This content is available online at \(<\text{http://cnx.org/content/m20954/1.1/>}\).
2.9.6.2.1 GROUP ASSESSMENT

Evaluate your work on a scale of 1 - 4 by circling the appropriate number.
1 = needs attention
2 = fairly good
3 = very good
4 = outstanding

2.9.6.2.2 CRITERIA

| All the members of the group participated in the activities. | 1 | 2 | 3 | 4 |
| Members of the group listened to one another. | 1 | 2 | 3 | 4 |
| Members of the group helped and encouraged each other. | 1 | 2 | 3 | 4 |
| Group members adhered to the instructions. | 1 | 2 | 3 | 4 |
| Each one had a chance to talk. | 1 | 2 | 3 | 4 |
| The group’s work was done neatly. | 1 | 2 | 3 | 4 |
| The answers were calculated correctly. | 1 | 2 | 3 | 4 |

Table 2.19

2.9.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:
1.10.1: multiplying in columns;
1.10.5: using a calculator.
2.10 To calculate with the help of selected operations appropriate to solving the problem

2.10.1 MATHEMATICS

2.10.2 Multiplication

2.10.3 EDUCATOR SECTION

2.10.4 Memorandum

2.10.5 LEARNER SECTION

2.10.6 Content

2.10.6.1 Activity: To calculate with the help of selected operations appropriate to solving the problem [LO 1.8.4]

1. Now use any method and calculate:
   - 654 \times 78
     \begin{align*}
     \hline
     654 & \quad \times \quad 78 \\
     \hline
     5232 & \\
     4588 & \\
     \hline
     51216 & \\
     \hline
     \end{align*}

   2. 426 \times 387
     \begin{align*}
     \hline
     426 & \quad \times \quad 387 \\
     \hline
     3702 & \\
     1278 & \\
     \hline
     166122 & \\
     \hline
     \end{align*}

   3. 729 \times 345
     \begin{align*}
     \hline
     729 & \quad \times \quad 345 \\
     \hline
     3645 & \\
     2115 & \\
     \hline
     252805 & \\
     \hline
     \end{align*}

TIME FOR SELF-_ASSESSMENT

It is important for us to know how you feel about the section of the work that we have completed. Give an indication of how well you understand it by reading the criteria and marking the appropriate blocks with a tick.

\[10^\text{This content is available online at } <\text{http://cnx.org/content/m20957/1.1/>}.\]
<table>
<thead>
<tr>
<th></th>
<th>GO</th>
<th>WAIT</th>
<th>STOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>I understand the powers of 10 and can do calculations with them. (LO 1.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can programme my calculator to multiply in powers of 10. (LO 1.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use an alternative method instead of multiplying by 25 (LO 1.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can multiply by 125 without using 125 as the multiplier. (LO 1.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know my tables. (LO 1.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I understand all the methods of multiplication shown in this module. (LO 1.11 and LO 2.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can calculate the product of any 2 numbers without using my calculator. (LO 1.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.20

2.10.6.1 BRAIN-TEASER!

In Scotland, in 1617, Lord John Napier used the following table for multiplication:

He calculated 456 x 8 in this manner:

His answer was 3 648.

1. Work with a friend. Can the two of you work out his method?
2. Use the table and calculate:
   2.1 698 x 5
   = .....................
   2.2 687 x 9
   = .....................

2.3 How would you calculate 6 437 x 382 by using the table??

= .....................

2.4 Give your friend a sum to do by using the table. Write the sum, calculation and the answer below.

2.5 Check your friend’s sum.

2.10.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.
**Assessment Standard 1.11:** We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 2.6:** We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

2.6.3: by number sentences.

### 2.11 To calculate with the use of selected operations that are appropriate for solving the problem

**2.11.1 MATHEMATICS**

**2.11.2 Multiplication**

**2.11.3 EDUCATOR SECTION**

**2.11.4 Memorandum**

**2.11.5 LEARNER SECTION**

**2.11.6 Content**

2.11.6.1 Activity: To calculate with the use of selected operations that are appropriate for solving the problem [LO 1.6.1]

CHALLENGE!!

---

Mrs Bengu had to buy breakfast cereal for a camp. After doing thorough research to find the cheapest product, she settled for this cereal, which sold at R14.95 per box.

1. How much did Mrs Bengu have to pay for 38 boxes? (Use your calculator).

2. How much change did she receive if she paid with three R200 notes?

---

2.11.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

---

111This content is available online at <http://cnx.org/content/m20958/1.1/>. 
**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).

2.12 To ask simple questions and identify relevant data

2.12.1 MATHEMATICS

2.12.2 Multiplication

2.12.3 EDUCATOR SECTION

2.12.4 Memorandum

2.12.5

2.12.6

2.12.7 LEANER SECTION

2.12.8 Content

2.12.8.1 Activity: To ask simple questions and identify relevant data [LO 5.1]

2.12.8.2 To collect data and answer questions [LO 5.2]

2.12.8.3 To organise and record data [LO 5.4]

2.12.8.4 To investigate data to describe the main tendency [LO 5.5]

2.12.8.5 To draw graphs [LO 5.6.1/2]

2.12.8.6 To read and interpret data critically [LO 5.7.2]

** This task is for your portfolio.

Do it as neatly as you can, but first take note of how it will be assessed.

1. Let us look at your classmates’ habits when it comes to eating breakfast. Find out what the other learners in your class have for breakfast.

2. Use the block below as a record sheet for recording your information:

Example:

<table>
<thead>
<tr>
<th>GRADE 6</th>
<th>NO. OF LEARNERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAKFAST</td>
<td></td>
</tr>
<tr>
<td>Warm porridge</td>
<td>2</td>
</tr>
<tr>
<td>Bread</td>
<td>1</td>
</tr>
<tr>
<td>Rusks</td>
<td>6</td>
</tr>
<tr>
<td>Cereals</td>
<td>3</td>
</tr>
<tr>
<td>Fruit</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 2.21

12 This content is available online at [http://cnx.org/content/m20959/1.1/].
3. You have already got to know a variety of graphs. (Do you remember any?) See whether you are able to record the information from the record sheet in a graph.

![Graph](image)

**Table 2.22**

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>No. of learners</th>
</tr>
</thead>
</table>

4. Find out WHICH breakfast food is the most popular among your class mates.

5. Find out the price per box/container of this item and calculate what you would have to pay if you bought ONE box for EACH learner in your class.

6. Write a short report concerning your class mates’ breakfast choices and habits.
2.12.9 Assessment

Learning Outcome 5: The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.1: We know this when the learner poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

Assessment Standard 5.2: We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher, class and self;

Assessment Standard 5.4: We know this when the learner organises and records data using tallies and tables;

Assessment Standard 5.5: We know this when the learner examines ungrouped numerical data to determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order to describe central tendencies;

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped):

5.6.1: pictographs with a many-one correspondence and appropriate keys;

5.6.2: bar graphs and double bar graphs;

Assessment Standard 5.7: We know this when the learner critically reads and interprets data presented in a variety of ways (including own representations, representations in the media – words, graphs, pie graphs) to draw conclusions and make predictions sensitive to the role of:

5.7.2: categories within the data (e.g. age, gender, race).

TEST
1. Fill in the missing words:

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neatness and organisation</td>
<td>The work is untidy and incomplete.</td>
<td>The work is organised, but is difficult to read.</td>
<td>The work is neat and organised and reads easily.</td>
<td>Neat, clearly set out work; easy to read.</td>
</tr>
<tr>
<td>Graph</td>
<td>The learner has not made any effort.</td>
<td>Most of the information is indicated incorrectly.</td>
<td>One or two mistakes occur.</td>
<td>The graph is correct and neat.</td>
</tr>
<tr>
<td>Degree of completeness</td>
<td>No research was undertaken. Some questions remain unanswered.</td>
<td>Much of the required information is missing.</td>
<td>Only very few questions remain unanswered.</td>
<td>The task is completed fully.</td>
</tr>
<tr>
<td>Correctness of calculations</td>
<td>All the answers are calculated incorrectly.</td>
<td>Many mistakes occur.</td>
<td>Few mistakes were made.</td>
<td>All the answers are correctly calculated.</td>
</tr>
</tbody>
</table>

Table 2.23
In $17 \times 240 = 4080$ we call:

1. $408$ the _________________________________________________________
2. $17$ the _________________________________________________________

- $4080$ a _____________________________________________ of $240$.

(3)

2. Write down all the factors of $36$:

_______________________________________________________________
_______________________________________________________________

(2)

3. Draw a circle around the mistake(s) in the following sum:

\[
h = 953 \times 18
\]

953
18
7634
9630
17264

(3)

4. Calculate the following. Show all your calculations:

4.1 $m = 239 \times 37$

__________________________________________
__________________________________________
__________________________________________
__________________________________________
__________________________________________

(3)

4.2 A farmer transports $238$ crates with $85$ apples in each crate to the market. How many apples were delivered to the market?

__________________________________________
__________________________________________
__________________________________________
__________________________________________

(4)

2.13 To perform mental calculations\textsuperscript{13}

2.13.1 MATHEMATICS

2.13.2 Division

2.13.3 EDUCATOR SECTION

2.13.4 Memorandum

1. inverse

\textsuperscript{13}This content is available online at \textlangle http://cnx.org/content/m20974/1.1/\rangle.
2. dividend; kwotient; divider
3. remainder
4. one
5. naught
6. half

2.13.5

2.13.6 LEANER SECTION

2.13.7 Content

2.13.7.1 Activity: To perform mental calculations [LO 1.9.3]

For a long time you have known how important it is to be able to do mental calculations. By now you probably also know your multiplication tables very well! But how well do you know division tables? Decode the following as quickly as you can:

Write your answer in the empty blocks underneath the sums.

<table>
<thead>
<tr>
<th>A</th>
<th>D</th>
<th>I</th>
<th>E</th>
<th>C</th>
<th>Y</th>
<th>L</th>
<th>M</th>
<th>O</th>
<th>N</th>
<th>V</th>
<th>N</th>
<th>U</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>12</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>10</td>
<td>3</td>
<td>2</td>
<td>14</td>
<td>11</td>
<td>9</td>
<td>13</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2.24

LET US REVISE!

The answers to the following questions are hidden in the word search. Look for the answers with a friend and then colour in neatly.

Table 2.25

1. Division is the _____________________________ of multiplication.
2. In 3 860 \( \div 20 = 193 \) is
3. 680 the _______________________________ and 
   193 the _______________________________ and
4. 20 the _______________________________ 
5. If a number can’t be divided precisely into a dividend, we call the amount that is left over, the
4. Any number that is divided by ________________________________ remains unchanged.
5. Division by ________________________________ is undefined.
6. If we ________________________________ a number, we divide it by 2.

2.13.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations involving:
1.9.3: division with small numbers.

2.14 To recognise, describe and use

2.14.1 MATHEMATICS

2.14.2 Division

2.14.3 EDUCATOR SECTION

Memorandum
1.1 last 0 falls away
   each number moves 1 place to the right
1.2 last 2 naughts falls away
   each number moves 2 places to the right
1.3 last 3 noughts falls away
   each number moves 3 places to the right
1.4 last 4 noughts falls away
   each number moves 4 places to the right
7.

<table>
<thead>
<tr>
<th>7.1 38</th>
<th>380</th>
<th>3 800</th>
<th>38 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.2 12</td>
<td>120</td>
<td>1 200</td>
<td>12 000</td>
</tr>
<tr>
<td>7.3 9</td>
<td>90</td>
<td>900</td>
<td>9 000</td>
</tr>
<tr>
<td>7.4 4</td>
<td>40</td>
<td>400</td>
<td>4 000</td>
</tr>
<tr>
<td>7.5 ½ / 0,5</td>
<td>5</td>
<td>50</td>
<td>500</td>
</tr>
</tbody>
</table>

Table 2.26

---

14This content is available online at <http://cnx.org/content/m20975/1.1/>.
2.14.4

2.14.5

2.14.6 LEANER SECTION

2.14.7 Content

2.14.7.1 Activity: To recognise, describe and use [LO 1.12.1]

As with multiplication, there are particular rules for division by multiples of 10, that enable you to calculate answers in a flash – without using pencil and paper! You have to form groups of three learners for the following activity.

1. See if you can formulate rules for the following:
   2. Division by 10: __________________________________________________
      __________________________________________________
      __________________________________________________
   3. Division by 100: _________________________________________________
      __________________________________________________
      __________________________________________________
   4. Division by 1 000: ______________________________________________
      __________________________________________________
      __________________________________________________
   5. Division by 10 000: _______________________________________________
      __________________________________________________
      __________________________________________________

6. Compare your answers with those of the class!

7. How quickly can YOU write down the answers to the following without using a calculator?

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>÷ 10 000</th>
<th>÷ 1 000</th>
<th>÷ 100</th>
<th>÷ 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. g.</td>
<td>560 000</td>
<td>56</td>
<td>560</td>
<td>5 600</td>
</tr>
<tr>
<td></td>
<td>380 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>120 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>90 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 7.1    |          |         |        |       |
| 7.2    |          |         |        |       |
| 7.3    |          |         |        |       |
| 7.4    |          |         |        |       |
| 7.5    |          |         |        |       |

7.1 380 000  .......................  38 000  .......................  3 800  .......................  380  .......................  38  .......................  3 8.  .......................  3.8  .......................  0.38  .......................  0.038  .......................  0.0038

7.2 120 000  .......................  12 000  .......................  1 200  .......................  120  .......................  12  .......................  1.2  .......................  0.12  .......................  0.012  .......................  0.0012  .......................  0.00012

7.3 90 000  .......................  9 000  .......................  900  .......................  90  .......................  9  .......................  0.9  .......................  0.09  .......................  0.009  .......................  0.0009  .......................  0.00009

7.4 40 000  .......................  4 000  .......................  400  .......................  40  .......................  4  .......................  0.4  .......................  0.04  .......................  0.004  .......................  0.0004  .......................  0.00004

7.5 5 000  .......................  500  .......................  50  .......................  5  .......................  0.5  .......................  0.05  .......................  0.005  .......................  0.0005  .......................  0.00005

Table 2.27

2.14.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.12: We know this when the learner recognises, describes and uses:

1.12.1: divisibility rules for 2, 5, 10, 100 and 1 000.
2.15 To use divisibility rules\(^1\)

2.15.1 MATHEMATICS

2.15.2 Multiplication

2.3.1.1 12
1.2 6
1.3 9
1.4 8
1.5 5
1.6 12
1.7 45
1.8 50
1.9 900
1.10 500
1.11 580
1.12 100
1.13 2
1.14 12.5 / 12½
1.15 6

2.15.3 LEARNER SECTION

2.15.3.1 Content

2.15.3.2 Activity: To use divisibility rules [LO 1.12.1]

Now you can test your skill in division and use the new knowledge that you have gained effectively. Let us see how you cope with the following mental calculation test. Write down answers only, as quickly as you can.

1.1 72 \div 6 = \underline{\hspace{1cm}}
1.2 54 \div 9 = \underline{\hspace{1cm}}
1.3 63 \div 7 = \underline{\hspace{1cm}}
1.4 48 \div \underline{\hspace{1cm}} = 6
1.5 35 \div \underline{\hspace{1cm}} = 7
1.6 108 \div \underline{\hspace{1cm}} = 9
1.7 \underline{\hspace{1cm}} \div 5 = 9
1.8 4500 \div \underline{\hspace{1cm}} = 90
1.9 45000 \div 50 = \underline{\hspace{1cm}}
1.10 45000 \div \underline{\hspace{1cm}} = 90
1.11 5800 \div 10 = \underline{\hspace{1cm}}
1.12 8900 \div \underline{\hspace{1cm}} = 89
1.13 2420 \div 20 = (2420 \div 10) \div \underline{\hspace{1cm}}
1.14 A half \times 25 = \underline{\hspace{1cm}}
1.15 (30 \div 5) = (36 \div \underline{\hspace{1cm}})

15

Fill in: I got \underline{\hspace{1cm}} correct!

TIME FOR SELF-ASSESSMENT!

How well do you know the work we have done up to now? Indicate this by marking the appropriate block:

\(^1\)This content is available online at <http://cnx.org/content/m20980/1.1/>.
<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Very uncertain</th>
<th>Somewhat uncertain</th>
<th>Very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know my ( \div ) tables. (LO 1.9)</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>I knew most of the revision questions. (LO 1.12)</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>I can formulate rules for division by powers of ( 10 ) (10 ; 100 ; 1 000 ; 10 000) (LO 1.12)</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>I can divide correctly by ( 1 000 ) (LO 1.12)</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>I can divide correctly by ( 10 000 ) (LO 1.12)</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>It is easy for me to divide by ( 10 ) and ( 100 ) (LO 1.12)</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

Table 2.28

**BRAIN-TEASER!**

Francois has a bag of marbles. If he divides them into groups of \( 4 \), 2 are left over. If he divides them into groups of \( 5 \), 1 is left over. How many marbles can there be in his bag? Could you write down 5 possible answers in the bag?

---

**Figure 2.10**

---

### 2.15.4 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.12:** We know this when the learner recognises, describes and uses:

**1.12.1:** divisibility rules for 2, 5, 10, 100 and 1 000.
2.16 To use a range of techniques for performing calculations\(^{16}\)

2.16.1 MATHEMATICS

2.16.2 Multiplication

2.16.3 EDUCATOR SECTION

2.16.4 Memorandum

\[
\begin{array}{|c|c|}
\hline
\text{Dividend} & \text{Quotient} \\
\hline
420 \div 40 & 9,952 \\
1,500 \div 50 & 28,358 \\
4,440 \div 30 & 143,065 \\
25,240 \div 40 & 573,545 \\
68,440 \div 70 & 1,052,877 \\
\hline
\end{array}
\]

Table 2.29

2.16.5 BRAIN TEASERS

\(x\) Divider with answer / number before the comma.

Subtract this answer from the dividend.

2.16.6 LEANER SECTION

2.16.7 Content

Activity: To use a range of techniques for performing calculations [LO 1.10.2, LO 1.10.5]

1. It helps a lot to first ESTIMATE an answer before you calculate the quotient. Work through the following examples with a friend:

\(^{16}\)This content is available online at \(<\text{http://cnx.org/content/m31925/1.1/>}\).
2. Complete the following table on your own. You may use a calculator for the answers in the last column.

<table>
<thead>
<tr>
<th>SUM</th>
<th>ROUND OFF</th>
<th>ESTIMATED ANSWER</th>
<th>ACTUAL ANSWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.g. $87 \div 22$</td>
<td>$90 \div 20$</td>
<td>4</td>
<td>4.5</td>
</tr>
<tr>
<td>2.1 $418 \div 42$</td>
<td>..................</td>
<td>..................</td>
<td>..................</td>
</tr>
<tr>
<td>2.2 $1503 \div 53$</td>
<td>..................</td>
<td>..................</td>
<td>..................</td>
</tr>
<tr>
<td>2.3 $4435 \div 31$</td>
<td>..................</td>
<td>..................</td>
<td>..................</td>
</tr>
<tr>
<td>2.4 $25236 \div 44$</td>
<td>..................</td>
<td>..................</td>
<td>..................</td>
</tr>
<tr>
<td>2.5 $68437 \div 65$</td>
<td>..................</td>
<td>..................</td>
<td>..................</td>
</tr>
</tbody>
</table>

Table 2.30

Did you know?

In the sum $77 \div 22 = 3.5$, the .5 shown on the calculator is NOT the remainder but actually a decimal fraction!

$.5 = 5$ tenths
$77 \div 22 = 3 \text{ rem } 11$

- Can you see that .5 is not equal to 11, but
to 0.5 of 22, which is 11?

BRAIN-TEASER!

- How can you use your calculator to find a whole number remainder?
2.16.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.2: long division;
1.10.5: using a calculator.

2.17 To use a range of techniques for performing calculations

2.17.1 MATHEMATICS

2.17.2 Multiplication

2.17.3 EDUCATOR SECTION

2.17.4 Memorandum

1.1 351 rem 5
1.2 19 rem 120
1.3 16 rem 420
1.4 60 rem 1 536

2.17.5 LEARNER SECTION

2.17.6 Content

2.17.6.1 Activity 2.5 To use a range of techniques for performing calculations [LO 1.10.5]

1. Calculate the following with your calculator. The remainder may not be written as a decimal fraction but as an answer with a remainder, like in a normal division sum.

1.1 \( y = 356 \div 27 \)

\[ \begin{array}{l}
\hline
356 \\
-27 \\
\hline
29 \\
-27 \\
\hline
2 \\
\hline
\end{array} \]

1.2 \( h = 4 984 \div 256 \)

\[ \begin{array}{l}
\hline
4984 \\
-256 \\
\hline
2448 \\
-256 \\
\hline
1992 \\
-256 \\
\hline
1736 \\
-1736 \\
\hline
0 \\
\hline
\end{array} \]

1.3 \( q = 13 684 \div 829 \)

\[ \begin{array}{l}
\hline
13684 \\
-829 \\
\hline
6395 \\
-829 \\
\hline
5566 \\
-829 \\
\hline
4737 \\
-829 \\
\hline
3848 \\
-829 \\
\hline
2959 \\
-829 \\
\hline
2060 \\
-829 \\
\hline
1271 \\
-829 \\
\hline
442 \\
\hline
\end{array} \]

17This content is available online at http://cnx.org/content/m20984/1.1/.
2.17.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.5: using a calculator.

2.18 To investigate and extend patterns\(^{18}\)

2.18.1 MATHEMATICS

2.18.2 Division

2.18.3 EDUCATOR SECTION

2.18.4 Memorandum

2. Consists of consecutive numbers.

3.

15,3243243
18,3243243
21,3243243

2.18.5 LEARNER SECTION

2.18.6 Content

2.18.6.1 Activity: To investigate and extend patterns [LO 2.1.4]

There are many interesting patterns in mathematics – not only geometric patterns, but numerical patterns as well.

1. Look at the following interesting patterns while you have your calculator with you.

\[
123 \div 37 = \]

\[
234 \div 37 = \]

\[
345 \div 37 = \]

\[
456 \div 37 = \]

2. What do you notice as you study the dividends in 1?

_____________________________________________________________________

3. Predict now (without your calculator!):

a) \[367 \div 37 = \]

b) \[678 \div 37 = \]

\(^{18}\)This content is available online at <http://cnx.org/content/m20985/1.1/>. 
c) $789 \div 37 = \underline{\hspace{10cm}}$

4. Now check your answers with the calculator.

BRAIN-TEASER!

Look at the following interesting figure:

Can you divide this figure into two pentagons (5-sided figures) and three rectangles, by only drawing two straight lines?

---

Image not finished

Figure 2.12

---

2.18.7 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.1: We know this when the learner investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:

2.1.4: of the learner’s own creation.

2.19 To use a range of techniques to perform calculations\(^{19}\)

2.19.1 MATHEMATICS

2.19.2 Division

2.19.3 EDUCATOR SECTION

2.19.4 Memorandum

2.19.5 LEARNER SECTION

2.19.6 Content

2.19.6.1 Activity: To use a range of techniques to perform calculations [LO 1.10.2]

Divide the class into groups of three. Ask the educator for the paper that you will need and answer the following questions as accurately and neatly as you can:

1. The product of two numbers is 20 856. If one of the numbers is 79, what is the other number?
2. Mr Dlamini’s heart beats at a rate of 4 500 beats in one hour. How many times will it beat in a minute?
3. At a particular prize draw the announcer says that the winning number is exactly divisible by 26. The number on Zwandor’s ticket is 15 249. Does he have the winning ticket?
4. If 203 identical elephant tusks weigh 21 975 kg in total, how much will one of them weigh?
5. Buses are hired to transport 48 675 spectators to a soccer match. How many buses will be needed to get everyone to the soccer match if each bus can take 113 spectators?
6. Check your answers with the help of a pocket calculator.

\(^{19}\)This content is available online at <http://cnx.org/content/m20988/1.1/>.
7. Explain how your group calculated the answers to the rest of the class.
8. Compare your methods. How do they differ?

2.19.6.1.1 GROUP ASSESSMENT

Evaluate yourselves on a scale of 1–4.

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-operation within group</td>
<td>Needs attention</td>
<td>Fairly good</td>
<td>Very good</td>
<td>Outstanding</td>
</tr>
<tr>
<td>Neatness of calculations</td>
<td>Needs attention</td>
<td>Fairly good</td>
<td>Very good</td>
<td>Outstanding</td>
</tr>
<tr>
<td>Mathematical errors</td>
<td>0 - 29 % error free</td>
<td>30 - 49 % error free</td>
<td>50 - 79 % error free</td>
<td>80 - 100 % error free</td>
</tr>
</tbody>
</table>

Table 2.31

Did you know?
Dinosaurs had up to 2 400 teeth in their mouths, while we only have 28!

2.19.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

*Assessment Standard 1.10:* We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.2: long division.

2.20 To determine the equivalence and validity of a variety of representations

2.20.1 MATHEMATICS

2.20.2 Division

2.20.3 EDUCATOR SECTION

2.20.4 Memorandum

2.20.5 LEANER SECTION

2.20.6 Content

2.20.6.1 Activity: To determine the equivalence and validity of a variety of representations [LO 2.6.3]

2.20.6.2 To use a variety of strategies to check solutions [LO 1.11]

Activity 2.7 has shown that there are different methods for calculating a quotient. Work through the different solutions to the following problem (with a partner):

20This content is available online at <http://cnx.org/content/m20991/1.1/>. 
How many people together would have the same amount of teeth as one of these dinosaurs?

1. I must divide 2400 by 28.
   I estimate 28 goes into 2400 about 50 times.
   I know 28 x 100 = 2800
   Thus: 28 x 50 = 1400
   And 28 x 25 = 700

   \[
   \begin{array}{c}
   \underline{2\ 4\ 0\ 0} \\
   -1\ 4\ 0\ 0 \ (50 \times 28) \\
   \underline{1\ 0\ 0\ 0} \\
   -\ 7\ 0\ 0 \ (25 \times 28) \\
   \underline{3\ 0\ 0} \\
   -\ 2\ 8\ 0 \ (10 \times 28) \\
   \underline{2\ 0}
   \end{array}
   \]

   Figure 2.13

   The answer is thus 50 + 25 + 10 = 85 people. 20 teeth are left over.

2. I must calculate \(2400 \div 28\) in this way:

   \[
   \begin{array}{c}
   8\ 5 \\
   28 \left\lfloor 2\ 4\ 0\ 0 \\
   -\ 2\ 2\ 4 \ 8 \times 28 \\
   1\ 6\ 0 \\
   -\ 1\ 4\ 0 \ 5 \times 28 \\
   2\ 0
   \end{array}
   \]

   Figure 2.14

   There are thus 85 people, because there are 8 teeth too few for another person.

3. Can you solve the problem in any other way without using a calculator?

   _______________________________________________________________
   _______________________________________________________________
   _______________________________________________________________
   _______________________________________________________________
   _______________________________________________________________
   _______________________________________________________________
   _______________________________________________________________

2.20.7 Assessment

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.
Assessment Standard 2.6: We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:
  2.6.3: by number sentences.

2.20.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.11: We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

2.21 To use a range of techniques to perform calculations

2.21.1 MATHEMATICS

2.21.2 Division

2.21.3 EDUCATOR SECTION

2.21.4 Memorandum

1.1 7
  1.2 9
  1.3 12
  1.4 5
  1.5 64
  1.6 17
  1.7 23
  1.8 43
  1.9 26
  1.10 1 555
  1.11 10
  1.12 72
  1.13 54
  1.14 11
  1.15 2 709

2.21.5 LEARNER SECTION

2.21.6 Content

2.21.6.1 Activity: To use a range of techniques to perform calculations [LO 1.10.2]

Let us see how well you are able to apply your acquired knowledge of division. Calculate the following without using a pocket calculator. You may use whichever method you prefer.

1. \( t = 1528 \div 24 \)

\[ \begin{array}{cccccccccccc}
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
& & & & & & & & & & & & \\
\end{array} \]

21This content is available online at <http://cnx.org/content/m20995/1.1/>. 
2. \( g = \frac{10001}{32} \)

3. \( y = \frac{48867}{26} \)

4. \( z = \frac{57906}{374} \)

5. \( d = \frac{126458}{519} \)

BRAIN-TEASER!

During a competition, the Grade 5, 6 and 7's tie. 21 cool drink cans are delivered to them at the school. Seven of the cans are completely full and 7 are half-full. Seven empty cans are also delivered.

How will you divide the cool drink among the three grades so that everyone gets the same amount of cool drink and cans? (Hint: make a sketch!)

TIME FOR SELF-ASSESSMENT

It is important for us to know how you feel about the section of the work that you have just completed. Evaluate yourself by placing a tick in the appropriate space:
I can estimate the quotient by rounding off the divisor and the dividend. (LO 1.10)  

<table>
<thead>
<tr>
<th></th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
</tr>
</thead>
</table>

I can estimate the quotient by making use of doubling. (LO 1.10)  

<table>
<thead>
<tr>
<th></th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
</tr>
</thead>
</table>

I can estimate the quotient by making use of multiplication. (LO 1.10)  

<table>
<thead>
<tr>
<th></th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
</tr>
</thead>
</table>

I can predict the quotient by looking at certain patterns on my calculator. (LO 2.1)  

<table>
<thead>
<tr>
<th></th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
</tr>
</thead>
</table>

I can divide correctly and determine a remainder, without using my calculator. (LO 1.11)  

<table>
<thead>
<tr>
<th></th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
<th>_____</th>
</tr>
</thead>
</table>

** Ask your educator’s help!

2.21.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.2: long division.
2.22 To perform mental calculations

2.22.1 MATHEMATICS

2.22.2 Division

2.22.3 EDUCATOR SECTION

2.22.4 Memorandum

2.22.5 LEARNER SECTION

2.22.6 Content

2.22.6.1 Activity: To perform mental calculations [LO 1.9.3]

1. You have done a lot of division with large numbers. Can you still do it with smaller numbers? Complete the following mental calculation test as neatly and accurately as possible. Connect the correct answers to see what is hiding here.

1.1 \(35 \div 5 = \) __________________
1.2 \(36 \div 4 = \) __________________
1.3 \(96 \div 8 = \) __________________
1.4 \(125 \div 25 = \) __________________
1.5 \(6 400 \div 10 = \) __________________
1.6 \(85 \div 5 = \) __________________
1.7 \(92 \div 4 = \) __________________
1.8 \(258 \div 6 = \) __________________
1.9 \(182 \div 7 = \) __________________
1.10 Halve 3110: __________________
1.11 \(10 \div 10 = \) __________________
1.12 __________________ \(\div 9 = 8\)
1.13 __________________ \(\div 6 = 9\)
1.14 \(132 \div \) __________________ \(= 12\)
1.15 Halve 5418: __________________
15

Complete: A .................................................. was hiding away

Figure 2.15

2.22.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

\(^2^2\)This content is available online at <http://cnx.org/content/m20996/1.1/>. 
Assessment Standard 1.9: We know this when the learner performs mental calculations involving:
1.9.3: division with small numbers.

2.23 To solve problems in context

2.23.1 MATHEMATICS

2.23.2 Division

2.23.3 EDUCATOR SECTION

2.23.4 Memorandum

2.23.5 LEARNER SECTION

2.23.6 Content

2.23.6.1 Activity: To solve problems in context [LO 1.6.1]
**This task will be placed in your portfolio. You will need a newspaper for this activity. Read the assignment carefully and answer the questions that follow. Work as neatly as you can, but have a good look at what your educator will be assessing before you start the task.

1. Use your local newspaper for examples and prices of the following items. Cut them out and paste them below. Write the prices below each example.
   1.1 Colour TV
   1.2 Computer
   1.3 Fridge
   1.4 Cell phone

2. Imagine you have R40 000 to spend. How many of these items would you be able to afford? (You may use your calculator)

   Colour TV: __________________________________________________________
   Computer: __________________________________________________________
   Fridge: ____________________________________________________________
   Cell phone: _________________________________________________________

3. Also look for advertisements from a local supermarket. Paste in examples of the following items and write their prices below each example:
   3.1 one litre of milk
   3.2 a loaf of brown bread
   3.3 a kilogram of cheese
   3.4 a packet of sugar

4. Imagine you have R250,00 to spend. How many of the above-mentioned items would you be able to buy? (You may use your calculator)

   Milk: _____________________________________________________________
   Bread: ____________________________________________________________
   Cheese: ___________________________________________________________
   Sugar: _____________________________________________________________

5. Colour the correct answer in:

---

23This content is available online at <http://cnx.org/content/m20998/1.1/>. 
The newspaper activities were.

<table>
<thead>
<tr>
<th></th>
<th>EASY</th>
<th>DIFFICULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>I could calculate the answers.</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>I could round off the cents correctly.</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

Table 2.33

2.23.7 ASSESSMENT: NEWSPAPER-BASED ACTIVITY

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neatness</td>
<td>The cutting out is done untidily. Pasting down lacks thoroughness.</td>
<td>Cutting out is done untidily. Everything is pasted into position.</td>
<td>Cutting out is fairly neat. Pasting is done fairly well.</td>
<td>The cutting out is very neat. Pasting down is done thoroughly.</td>
</tr>
<tr>
<td>Completeness</td>
<td>The advertisement is not cut out. Some answers have been left unanswered.</td>
<td>Much of the information is lacking.</td>
<td>Only very few questions are not answered.</td>
<td>The assignment is completed fully.</td>
</tr>
<tr>
<td>Mathematical errors</td>
<td>0 - 29% error free</td>
<td>30 - 49% error free.</td>
<td>50 - 78% error free.</td>
<td>80 - 100% error free.</td>
</tr>
</tbody>
</table>

Table 2.34

2.23.7.1

2.23.7.2 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount).
2.24 To perform mental calculations

2.24.1 MATHEMATICS

2.24.2 Division

2.24.3 EDUCATOR SECTION

2.24.4 Memorandum

2.24.5 LEARNER SECTION

2.24.6 Content

2.24.6.1 Activity: To perform mental calculations [LO 1.9.3]

• Let us play a game!

Play with a friend. You will each need a dice and sixteen markers. Make two boards of stiff cardboard that look like this:

• Each player now writes the following numbers on his board. You may write them where you want to.

20 ; 24 ; 32 ; 39 ; 40 ; 41 ; 48 ; 57 ; 59 ; 61 ; 66 ; 68 ; 69 ; 79 ; 86 ; 90

• When you are ready, number 1 throws the dice.

• The number that shows on the dice, is the **REMAINDER** that you will get when you divide a number on the board by 7. Close that number with one of your markers. Take turns to play. The player whose board is full of markers first, is the winner.

2.24.7 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.3: division with small numbers.

2.24.7.1 TEST 20

1. Fill in the missing words:

1.1 Any number divided by 1 is ________________________________

1.2 When we divide a number by 2, we say we ________________________________

the number. (2)

2. Complete the following flow diagrams:

---

24This content is available online at <http://cnx.org/content/m21000/1.1/>. 
3. Estimate the quotient by first rounding off the divisor to the nearest 10 and the dividend to the nearest 100:
   3.1 2 468 ÷ 47 = ___________________________(2)
   = ___________________________(2)
   3.2 3 639 ÷ 33 = ___________________________(2)
   = ___________________________(2)

4. Valerie had to calculate the following: 32 876 ÷ 26. She started, but could not complete the calculation. Complete the sum for her.

5. Calculate the following without a calculator:
   5.1 A fruit vendor buys 8 498 apples and packs them in boxes containing 35 apples each. How many boxes does he need?
5.2 How many rolls of chicken netting is needed to fence a camp of 1 598 m if each roll contains 45 m?

2.25 To recognise and classify numbers in order to describe and compare them

2.25.1 MATHEMATICS

2.25.2 Common and Decimal Fractions

2.25.3 Common Fractions

2.25.4 EDUCATOR SECTION

2.25.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:
1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

• It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

• This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
• Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.

25This content is available online at <http://cnx.org/content/m30956/1.1/>. 
• Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
• It should be possible to work through the module in 3 weeks.
• ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.
• ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

** LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
• This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

Figure 2.18
Figure 2.19

<table>
<thead>
<tr>
<th></th>
<th>IMPROPER FRACTION</th>
<th>MIXED NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>$\frac{14}{4}$</td>
<td>$3 \frac{1}{2}$</td>
</tr>
<tr>
<td>4.2</td>
<td>$\frac{19}{7}$</td>
<td>$3 \frac{5}{6}$</td>
</tr>
<tr>
<td>4.3</td>
<td>$\frac{13}{7}$</td>
<td>$2 \frac{1}{7}$</td>
</tr>
<tr>
<td>4.4</td>
<td>$\frac{11}{8}$</td>
<td>$1 \frac{3}{8}$</td>
</tr>
<tr>
<td>4.5</td>
<td>$\frac{9}{7}$</td>
<td>$4 \frac{1}{2}$</td>
</tr>
</tbody>
</table>

Table 2.36

2.25.6 LEARNER SECTION

2.25.7 Content

2.25.7.1 Common Fractions

In Grade 5 we spent much time working with fractions. Before beginning this year’s work, we need to know how well you can remember what you have learned! See if you can link the words in column A with the correct meanings in column B:
### Table 2.37

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerator</td>
<td>Indicates how many equal parts are coloured in/taken</td>
</tr>
<tr>
<td>Denominator</td>
<td>Numerator is smaller than the denominator</td>
</tr>
<tr>
<td>Equivalent fractions</td>
<td>Consists of a whole number and a proper fraction and is always bigger than 1</td>
</tr>
<tr>
<td>Proper fraction</td>
<td>Indicates the number of equal parts into which the whole has been divided</td>
</tr>
<tr>
<td>Improper fraction</td>
<td>Fractions of equal size</td>
</tr>
<tr>
<td>Mixed (fractional) number</td>
<td>The numerator is bigger than the denominator and the fraction is always bigger than 1</td>
</tr>
</tbody>
</table>

#### 2.25.7.2 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.3]

1. Kom ons hersien nog! Werk saam met ‘n maat en sê watter breukdeel van die vierkant Work with a friend and indicate which fraction of the square is represented by:

---

![Figure 2.20](image-url)

---

- A : ...................................................
- B : ...................................................
- C : ...................................................
- A + C : ...................................................
- B + C : ...................................................
1. \[
\begin{align*}
C + D : & \quad \text{..........................................................} \\
A + D : & \quad \text{..........................................................} \\
A + B : & \quad \text{..........................................................} \\
B + D : & \quad \text{..........................................................}
\end{align*}
\]

2. All the answers comprise \.......................................................... fractions.

3. Take a look at the picture of the bowl of apples. Colour the apples that represent proper fractions yellow, the improper fractions green and the mixed numbers red.

![Figure 2.21](image)

4. Complete the table:

<table>
<thead>
<tr>
<th>E.g.</th>
<th>IMPROPER FRACTION</th>
<th>MIXED NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>thirteen fifths</td>
<td>(\frac{13}{5})</td>
<td>2(\frac{3}{5})</td>
</tr>
<tr>
<td>fourteen quarters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nineteen sixths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fifteen sevenths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>eleven eighths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nine halves</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.38

2.25.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.3:** We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.3 common fractions, including specifically tenths, hundreds and percentages.
2.26 To calculate by selecting operations appropriate for solving problems

2.26.1 MATHEMATICS

2.26.2 Common and Decimal Fractions

2.26.3 Common Fractions

2.26.4 EDUCATOR SECTION

2.26.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:
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2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and /or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

\[
1.1 \frac{3}{5} = \frac{5}{10} = \frac{1}{2} \\
1.2 \frac{10}{15} = \frac{8}{12} = \frac{2}{3}
\]

\[This\ content\ is\ available\ online\ at\ <http://cnx.org/content/m31928/1.1/>.\]
2.26.6 LEANER SECTION

2.26.7 Content

2.26.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO1.8.7]

It is important for you to understand what an equivalent fraction is and also how to obtain it, because this will help you to put the correct relationship sign between two fractions.

2.26.7.1.1 DO YOU REMEMBER THIS?

Fractions of equal size are known as equivalent fractions.

1. Take a good look at the illustrations and write down the equivalent fractions, e.g.

\[
\begin{array}{c}
\frac{2}{5} = \frac{4}{10}
\end{array}
\]

Figure 2.23
2. Colour in those balloons that are equal to one quarter:

2.26.7.1.2 DID YOU KNOW?
Equivalent fractions make it possible to compare fractions with one another. If I have to fill in relationship signs, the denominators of the fractions have to be made the same.

\[
\frac{3}{4} \quad \quad \frac{9}{12}
\]

\[
\frac{3}{4} \times 3 = \frac{9}{12}
\]
2.26.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.7 equivalent fractions.

2.27 To recognise and classify numbers in order to describe and compare them

2.27.1 MATHEMATICS

2.27.2 Common and Decimal Fractions

2.27.3 Common Fractions

2.27.4 EDUCATOR SECTION

2.27.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.

---

27 This content is available online at [http://cnx.org/content/m30960/1.1/](http://cnx.org/content/m30960/1.1/).
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
• ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1
a) \( \frac{11}{16} \) 1
b) \( \frac{3}{4} \)
c) \( \frac{8}{16} \)
d) \( \frac{5}{8} \)
e) \( \frac{3}{8} \)
1.2
a) \( \frac{1}{8} \)
b) \( \frac{5}{8} \)
c) \( \frac{9}{16} \)
d) \( \frac{3}{8} \)
e) \( \frac{6}{8} \)
f) \( \frac{7}{16} \)
g) \( \frac{8}{16} \)
2. **BRAIN TEASER!**
2.1 \( \frac{6}{12} \)
2.2 \( \frac{12}{15} \)
2.3 \( \frac{3}{10} \)
2.4 \( \frac{4}{20} \)
2.5 \( \frac{5}{10} \)
3.
• >
3.2 <
• =
3.4 <
3.5 First make denominators the same

\[ \text{Figure 2.27} \]
2.27.6 LEANER SECTION

2.27.7 Content

2.27.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.3]

We have looked at fractions on a number line in earlier grades. When they are positioned as clearly as they are on the number line below, it is child’s play to compare them with each other and determine which are equivalent, which are larger or which are smaller than a given fraction. Here we have a few exercises to see if you are able to apply your knowledge of equivalent fractions correctly.

1. Examine the following diagram.

![Figure 2.28]

1.1 Write down the fractions that are missing:
   a) .........................................................
   b) .........................................................
   c) .........................................................
   d) .........................................................
   e) .........................................................

1.2 Write equivalent fractions for:
   a) .........................................................
   b) .........................................................
   c) .........................................................
   d) .........................................................
   e) .........................................................
3. Fill in: < ; > or =:
3.1 \( \frac{5}{7} \) ___________ \( \frac{2}{3} \)
3.2 \( \frac{4}{6} \) ___________ \( \frac{14}{10} \)
3.3 ___________ \( \frac{21}{33} \)
3.4 ___________ \( \frac{51}{33} \)
3.5 Are you able to explain how you found the answers?
4. Help to "catch" all the fish that have a value above \( \frac{1}{2} \) by colouring them in neatly.
5. Work with a friend and fill in: < ; > or = :
5.1 $\frac{3}{4}$ ............. $\frac{5}{8}$
5.2 $\frac{2}{3}$ ............. $\frac{5}{6}$
5.3 Explain to the rest of the class how you arrived at the answer.
6. Complete the following table:

<table>
<thead>
<tr>
<th>FRACTIONS</th>
<th>COMMON DENOMINATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.g.</td>
<td>$\frac{1}{2}$, $\frac{1}{3}$</td>
</tr>
<tr>
<td>6.1</td>
<td>$\frac{1}{5}$, $\frac{1}{7}$</td>
</tr>
<tr>
<td>6.2</td>
<td>$\frac{1}{4}$, $\frac{1}{5}$</td>
</tr>
<tr>
<td>6.3</td>
<td>$\frac{1}{6}$, $\frac{1}{9}$</td>
</tr>
<tr>
<td>6.4</td>
<td>$\frac{1}{5}$, $\frac{1}{8}$</td>
</tr>
<tr>
<td>6.5</td>
<td>$\frac{1}{2}$, $\frac{1}{5}$</td>
</tr>
</tbody>
</table>

Table 2.39

7. Draw a circle round the smallest fraction:
7.1 $\frac{2}{5}$, $\frac{3}{6}$
7.2 $\frac{3}{4}$, $\frac{2}{7}$
7.3 $\frac{4}{6}$, $\frac{2}{9}$

2.27.7.1.1 TIME FOR SELF-ASSESSMENT

How have you managed up to now? Are you ready for the next section of the work? Assess yourself on a scale of 1 - 4 to show us how you are coping:

1. = needs attention
2 = fairly good
3 = very good
4 = outstanding
CHAPTER 2. TERM 2

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I could match the words to the correct explanation on p. 3.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could answer no. 1 of Activity 1.1 correctly.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could find the proper fractions in no. 3. (LO 1.3)</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could find the improper fractions in no. 3. (LO 1.3)</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could find the mixed numbers in no. 3. (LO 1.3)</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could complete the table correctly in no. 4. (LO 1.3)</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could explain what equivalent fractions are. (LO 1.8)</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could correctly indicate my own equivalent fractions for ( \frac{1}{4} ) in no. 5.2. (LO 1.8)</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could also write down equivalent fractions for other fractions (no. 6)</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>I could fill in relationship signs correctly.</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

Table 2.40

2.27.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.3:** We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.3 common fractions, including specifically tenths, hundreds and percentages.

2.28 To perform mental calculations

2.28.1 MATHEMATICS

2.28.2 Common and Decimal Fractions

2.28.3 Common Fractions

2.28.4 EDUCATOR SECTION

2.28.5 Memorandum

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This content is available online at <http://cnx.org/content/m30961/1.1/>.
COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
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- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 48
1.2 5
1.3 6
1.4 6
1.5 6
1.6 30
1.7 24
1.8 38
1.9 33
1.10 95
1.11 999
1.12 49
1.13 33
1.14 108
1.15 12

2.28.6 LEARNER SECTION

2.28.7 Content

2.28.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

Let’s see how you cope in the first mental arithmetic test!
Table 2.41

| 1.1 $8 \times 6$ = .................. | 1.9. $37 +$ ......................... $= 70$ |
| 1.2. $7 \times$ .............. $= 35$ | 1.10. $1000 - 49 =$ .................. |
| 1.3. $42 \div 7$ = .............. | 1.11. $10003 - 8 =$ .................. |
| 1.4. $54 \div$ .............. $= 9$ | 1.12. $16 + 18 + 15 =$ .................. |
| 1.5. $\frac{2}{3} = \frac{5}{9}$ | 1.13. $27 +$ ......................... $= 60$ |
| 1.6. $\frac{5}{9} = \frac{20}{36}$ | 1.14. $12 \times 9 =$ .................. |
| 1.7. $\frac{5}{9} = \frac{24}{54}$ | 1.15. $96 \div$ ......................... $= 8$ |
| 1.8. $\frac{2}{9} = \frac{16}{20}$ |

Table 2.42

| Colour in: My results are | GOOD | AVERAGE | WEAK |

2.28.7.1.1 DO YOU REMEMBER THIS?

**Simplification** involves writing the fraction in a simpler form. This means that it is an equivalent fraction with a smaller numerator and denominator. For **simplifying** a fraction, we have to find a number that can be used to divide the numerator and denominator exactly.

Remember to look for the largest number that can be used to divide!

2.28.8 Assessment

**Learning Outcome 1:** Die leerder is in staat om getalle en die verwantskappe daarvan te herken, te beskryf en voor te stel, en om tydens probleemoplossing bevoeg en met selfvertrouen te tel, te skat, te bereken en te kontroleer.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations involving:
1.9.1 addition and subtraction;
1.9.2 multiplication of whole numbers to at least 12 x 12.
2.29 To recognise equivalent forms of numbers

2.29.1 MATHEMATICS

2.29.2 Common and Decimal Fractions

2.29.3 Common Fractions

2.29.4 EDUCATOR SECTION

2.29.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 \( \frac{2}{3} \)
1.2 \( \frac{11}{20} \)
1.3 \( \frac{2}{5} \)
1.4 \( \frac{3}{8} \)

\(^{29}\)This content is available online at <http://cnx.org/content/m30962/1.1/>.
2.29.6 LEANER SECTION

2.29.7 Content

2.29.7.1 ACTIVITY: To recognise equivalent forms of numbers  To recognise equivalent forms of numbers [LO 1.5.1]

If you know how to simplify and to apply it correctly, you will soon realise that it is a helpful aid when calculating with fractions. It can help you multiply, divide, add and subtract more easily (and quickly). You will also find it easier to fill in relationship signs. Let’s have a look at how you manage.

1. Simplify the following:
   1.1 \(\frac{10}{15}\)
   1.2 \(\frac{26}{40}\)
   1.3 \(\frac{45}{72}\)
   1.4 \(\frac{42}{63}\)

2. LET’S PLAY A GAME!

You’ll need a partner and two dice.

- Roll both dice and write the numbers that are on top as a proper fraction.
- Simplify the fraction, if this is possible.
- Your friend has to do the same.
- Decide whose fraction is larger.
- The one with the larger fraction claims 2 points.
- The winner is the one who gains the most points!

2.29.7.1.1 DO YOU REMEMBER THIS?

When we wish to do addition with fractions, the denominators have to be made similar.

Eg. \(\frac{1}{3} + \frac{3}{6}\)

Figure 2.32

\(\left(\frac{2}{5}\right) \frac{1}{3} + \frac{3}{6} = \frac{5}{6}\)

What you know about determining equivalent fractions will be useful when you do this.

2.29.7.1.2 NOTE THE FOLLOWING!

When the sum of two fractions is calculated, only the numerators are added together. The denominator is retained as it is.

2.29.7.1.3 ALSO REMEMBER!

If the answer is an improper fraction, you have to convert it to a mixed number.
2.29.8 Assessment

**Learning Outcome 1:** Die leerder is in staat om getalle en die verwantskappe daarvan te herken, te beskryf en voor te stel, en om tydens probleemoplossing bevoeg en met selfvertroue te tel, te skat, te bereken en te kontroleer.

**Assessment Standard 1.5:** We know this when the learner recognises and uses equivalent forms of the numbers listed above, including:

1.5.1 common fractions with 1-digit or 2-digit denominators.

2.30 ACTIVITY: To calculate by selecting operations appropriate to solving problems

2.30.1 MATHEMATICS
2.30.2 Common and Decimal Fractions
2.30.3 Common Fractions
2.30.4 EDUCATOR SECTION
2.30.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

**LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS**

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
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- **LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS**
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.

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30This content is available online at <http://cnx.org/content/m30963/1.1/>. 

As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

### 2.30.6 LEARNER SECTION

#### 2.30.7 Content

**2.30.7.1 Activity: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]**

You have to work in groups of three for this activity. Ask your educator for the paper that you will need. Read the questions attentively and show the operations that you use for calculating the answers:

1. Mrs Samuels buys one third of a metre of pink material and five sixths of a metre of purple material. How many metres of material does she have to make cushions for her class?
2. The Jansen family is picnicking. If Dad eats a quarter of the food, Mom eats three eighths of it and Sarah two eighths, will there be any left for you to eat?
3. The Grade 6 learners have been asked to establish a vegetable garden at the school. If they plant half of the garden with carrots, two sixths with potatoes and one twelfth with spinach, what fraction of the whole garden has been planted?
4. Because they have worked so hard in the garden, the classes are rewarded. The 6A class drinks four and one fifth litres of cold drink; the 6B class drinks five and four tenths litres of cold drink and the 6C class drinks three and two thirds litres. How many litres of cold drink did the school provide for the learners?
5. Explain how your group calculated the answers to the rest of the class.
6. Compare your methods. How do they differ?

#### 2.30.7.1.1 TIME FOR SELF-ASSESSMENT

Assess your work on a scale of 1 - 4 by circling the appropriate number:

1 = not at all 2 = just a little 3 = good 4 = outstanding

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>All group members participated in the activities.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Group members listened to one another.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Group members helped and encouraged each other.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Group members adhered to the instructions.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Each one had a chance to speak.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>The group’s work was neatly done.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>The answers were calculated correctly.</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

*Table 2.43*

### 2.30.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.
Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers);

2.31 ACTIVITY: To calculate by selecting operations appropriate to solving problems

2.31.1 MATHEMATICS

2.31.2 Common and Decimal Fractions

2.31.3 Common Fractions

2.31.4 EDUCATOR SECTION

2.31.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:
1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 Focuses on Common Fractions

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- **Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 Focuses on Decimal Fractions
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

31This content is available online at <http://cnx.org/content/m30965/1.1/>. 
• ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 \frac{7}{8} \\
1.2 \frac{14}{16} = \frac{14}{16} \\
1.3 \frac{18}{24} = \frac{18}{24} \\
1.4 \frac{25}{10} = \frac{25}{10}

2.3.1.6 LEARNER SECTION

2.3.1.7 Content

2.3.1.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]

1. Now that we have revised the addition of fractions, you shouldn’t have any difficulty with the following. Work on your own and calculate:

1.1 \frac{1}{8} + \frac{3}{4} \\
.................................................................................
.................................................................................
.................................................................................
.................................................................................

1.2 \frac{2}{3} + \frac{8}{9} \\
.................................................................................
.................................................................................
.................................................................................
.................................................................................

1.3 \frac{1}{7} + \frac{10}{17} \\
.................................................................................
.................................................................................
.................................................................................
.................................................................................

1.4 \frac{9}{16} + \frac{1}{2} \\
.................................................................................
.................................................................................
.................................................................................
.................................................................................

2.3.1.7.1.1 DO YOU KNOW THIS?

X 4X 4 We sometimes have to find a common denominator. In \frac{1}{3} + \frac{1}{4} for instance, it is difficult to change thirds into quarters or quarters into thirds. You find the common denominator by multiplying the two denominators. In our example, the common denominator is 3 x 4 = 12. We refer to 12 as the smallest common multiple of 3 and 4.

X 3X 3 Thus: \frac{1}{3} + \frac{1}{4} (\frac{1}{3} = \frac{4}{12})

= \frac{4}{12} + \frac{3}{12} (\frac{1}{4} = \frac{3}{12})

= \frac{7}{12}

This is what it looks like when we draw it:
2.31.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers);

2.32 To calculate by selecting operations appropriate to solving problems

2.32.1 MATHEMATICS

2.32.2 Common and Decimal Fractions

2.32.3 Common Fractions

2.32.4 EDUCATOR SECTION

2.32.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:
1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

---

\[ \frac{4}{12} \quad \frac{3}{12} \]

---

\[ \frac{1}{3} \quad \frac{1}{4} \]
It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
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- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 \( \frac{8+15}{20} = \frac{23}{20} \)
1.2 \( \frac{29+4}{6} = \frac{33}{6} = 1 \frac{1}{2} \)
1.3 \( \frac{6+20}{12} = \frac{26}{12} = 1 \frac{2}{15} \)

2.32.5.1 CLASS DISCUSSION
- Whole number + fraction
- First add whole numbers

First change all to improper fractions

2.32.6 LEARNER SECTION

2.32.7 Content

2.32.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]

1. Calculate by first finding the common denominator (smallest common multiple):
   1.1 \( \frac{5}{7} + \frac{2}{3} \)

..........................................................................................................................
2.32.7.1.1 CLASS DISCUSSION:

- First explain what a **mixed number** is.

- Name the different methods for calculating the sum of two **mixed numbers**.

2.32.8 Assessment

*Learning Outcome 1:* The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

*Assessment Standard 1.8:* We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers).

2.33 To solve problems in context

2.33.1 MATHEMATICS

2.33.2 Common and Decimal Fractions

2.33.3 Common Fractions

2.33.4 EDUCATOR SECTION

2.33.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

1. Number concept, Addition and Subtraction

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33This content is available online at [http://cnx.org/content/m31670/1.1/](http://cnx.org/content/m31670/1.1/).
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- **Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- $5 \frac{2+3}{4} = 5 \frac{5}{4} = 1 \frac{1}{4}$
- $1.21 \frac{5}{3} + 2 \frac{2}{3} = 3 \frac{31}{24} = 4 \frac{7}{8}$
- $1.33 \frac{1}{4} + 2 \frac{1}{5} = 5 \frac{9}{20}$
- $\frac{4}{7}$
- $5 \frac{15}{20}$

2.3 5 \frac{10}{27}

BRAIN TEASER!

$1 + \frac{1}{2} = 1 \frac{1}{2}$
$1 + \frac{1}{2} + \frac{2}{3} = 1 \frac{7}{6}$
$1 + \frac{2}{3} + \frac{2}{7} + \frac{3}{8} = 1 \frac{15}{16}$
$1 + \frac{7}{8} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} = 1 \frac{31}{32}$
CLASS DISCUSSION
4 Make denominators the same
4 Find lowest common multiple
4 Make all improper fractions
4 First subtract whole numbers

2.33.6 LEARNER SECTION

2.33.7 Content

2.33.7.1 ACTIVITY: To solve problems in context [LO 1.6.2]

1. Pair up with a friend and work together to solve the following problem:
   1.1 Mom uses $2\frac{1}{2}$ cups of sugar in one recipe and $3\frac{3}{4}$ cups of sugar in Altogether how many cups of sugar does she use?
   1.2 At a birthday party, Rafiek and his friends eat one and five eighths of the ham and salami pizzas. They also eat two and two thirds of the ham and pineapple pizzas. What fraction of the pizzas did they eat altogether?
   1.3 Rafiek and his friends also drank three and a quarter litres of Coke and two and one fifth litres of Cream Soda. What fraction of the cold drink did they drink?

2. Calculate the following by yourself:
2.1 $2\frac{5}{8} + 1\frac{2}{3}$
2.2 $3\frac{3}{4} + 2\frac{1}{5}$
2.3 $4\frac{7}{9} + 1\frac{2}{3}$

PUZZLE THIS OUT!

• Are you able to complete the fraction pattern?

\[
1 + \frac{1}{2} = 1\frac{1}{2}
\]
\[
1 + \frac{1}{2} + \frac{1}{4} = 1\frac{3}{4}
\]
Are you able to complete this magic square?

\[
\begin{array}{c|c|c}
\hline
\frac{5}{2} & 3 & \hline
\hline
2 & 4 & \hline
1 & \hline
\end{array}
\]

Table 2.44

CLASS DISCUSSION

- What must I do when the denominators of two fractions that have to be subtracted from one another?

- What is the simplest method for calculating the difference between two mixed numbers?

- Which other methods can be used?

REMEMBER THIS!
When fractions are used in subtraction, we only subtract the numerators. The denominator is kept as it is.

REMEMBER THIS AS WELL!
If the answer is in the form of an improper fraction, it must be converted to a mixed number.

2.33.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context, including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2 measurements in Natural Sciences and Technology contexts.

2.34 To perform mental calculations\(^{34}\)

2.34.1 MATHEMATICS

2.34.2 Common and Decimal Fractions

2.34.3 Common Fractions

2.34.4 EDUCATOR SECTION

2.34.5 Memorandum

INTRODUCTION

\(^{34}\)This content is available online at <http://cnx.org/content/m30969/1.1/>. 
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1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
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- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
- ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 \( \frac{9}{5} - \frac{7}{5} \) of 1 \( \frac{4}{5} - 1 \frac{2}{5} \)
1.2 \( \frac{11}{7} - \frac{9}{5} \) of 2 \( \frac{4}{7} - 1 \frac{3}{5} \)
1.3 \( \frac{11}{7} - \frac{4}{5} \) of 1 \( \frac{5}{7} - 1 \)

2.34.6 LEARNER SECTION

2.34.7 Content

2.34.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1]

1. Work with a partner. Which subtraction sums are presented on the number lines?

1.1
1.2

1.3

2.34.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving:

1.9.1 measurements in Natural Sciences and Technology contexts.
2.35 To calculate by selecting operations appropriate to solving problems

2.35.1 MATHEMATICS

2.35.2 Common and Decimal Fractions

2.35.3 Common Fractions

2.35.4 EDUCATOR SECTION

2.35.5 Memorandum

INTRODUCTION

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

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OWN METHOD

- $1 \frac{3}{8}$
- $1.23 \frac{1}{7}$
- $1.31 \frac{7}{14}$
- $1.42 \frac{1}{17}$

---

<http://cnx.org/content/m30972/1.1/>
2.35.6 LEARNER SECTION

2.35.7 Content

2.35.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.3]

Do you remember what you told one another about the subtraction of fractions during the class discussions? You should know by now that it can be done in more than one way. Calculate the following by using the method you find easiest:

1.1 \(5\frac{1}{4} - 3\frac{7}{8}\)

..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................

1.2 \(6\frac{1}{6} - 2\frac{7}{10}\)

..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................

1.3 \(3\frac{1}{2} - 1\frac{4}{5}\)

..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................

1.4 \(4\frac{3}{6} - 2\frac{1}{4}\)

..........................................................................................................
..........................................................................................................
..........................................................................................................
..........................................................................................................

TIME FOR SELF-ASSESSMENT

It is very important that you have a thorough understanding of the work we have done so far. Indicate how you feel about the work by placing a tick in the appropriate block:

<table>
<thead>
<tr>
<th>I can</th>
<th>Altogether unsure</th>
<th>Very unsure</th>
<th>Slightly unsure</th>
<th>Altogether sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>simplify fractions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>do addition with fractions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>that have denominators that</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>are multiples of one another</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

continued on next page
determine the smallest common multiple (common denominator) of two fractions (e.g. \( \frac{1}{3} + \frac{1}{5} \)) and then add them together. (LO 1.8)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>calculate the sum</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>of two mixed num-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bers (e.g. ( 3\frac{1}{2} + 2\frac{1}{4} )). (LO 1.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>correctly subtra-</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>ct fractions from</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>one another. (LO 1.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.45

2.35.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.3 addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers).

2.36 To perform mental calculations\(^{36}\)

2.36.1 MATHEMATICS

2.36.2 Common and Decimal Fractions

2.36.3 Common Fractions

2.36.4 EDUCATOR SECTION

2.36.5 Memorandum

**INTRODUCTION**

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\(^{36}\)This content is available online at <http://cnx.org/content/m30984/1.1/>.
COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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- LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
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1.1 70
1.2 983
1.3 438
1.4 354 \(\frac{1}{2}\)
1.5 9
1.6 132
1.7 8
1.8 \(\frac{5}{6}\)
1.9 \(\frac{5}{6}\)
1.10 27
1.11 29
1.12 \(\frac{7}{8}\)
1.13 \(\frac{11}{8}\)
1.14 \(\frac{3}{4}\)
1.15 10 000

2.36.6 LEARNER SECTION

2.36.7 Content

2.36.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1, LO 1.9.2]

Complete the following mental calculation test as quickly and accurately as possible and try to improve on your previous performance!
1.1 $26 + 19 + 25 = \ldots \ldots$
1.2 $1 004 - 21 = \ldots \ldots$
1.3. Double 219: \ldots \ldots
1.4. Halve 709: \ldots \ldots
1.5. $45 \div \ldots \ldots = 5$
1.6. $12 \times 11 = \ldots \ldots$
1.7 $56 \div \ldots \ldots = 7$
1.8 Simplify $\frac{15}{21}$:
1.9 Simplify $\frac{25}{30}$:
1.10 $3 \div \ldots \ldots = 9$
1.11 $3 \frac{3}{4} = \frac{\ldots \ldots}{\ldots}$
1.12 $\frac{1}{2} + \frac{3}{8} = \ldots \ldots$
1.13 $2 - \frac{7}{8} = \ldots \ldots$

Table 2.46

I have done \ldots \ldots correctly!

2.36.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations involving:

1.9.1 addition and subtraction;
1.9.2 multiplication of whole numbers to at least $12 \times 12$.

2.37 To calculate by selecting operations appropriate to solving problems

2.37.1 MATHEMATICS

2.37.2 Common and Decimal Fractions

2.37.3 Common Fractions

2.37.4 EDUCATOR SECTION

2.37.5 Memorandum

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This content is available online at <http://cnx.org/content/m30985/1.1/>. 
COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

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2.37.6 LEARNER SECTION

2.37.7 Content

2.37.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.6]

1. Divide into groups of three for the following activity. Your educator will provide the necessary paper. Read the questions carefully and see if you can find the solutions to the problems. Remember to show the operations that you use.
   a) A school bus can only transport one quarter of the school’s 268 athletes at a time. How many passengers can fit into the bus?
   b) Two thirds of the 1 944 soccer supporters were men. How many women attended the soccer game?
   c) Mr Jackson wanted to save three eighths of his salary of R10 856. What amount did he save?
   d) Nino wanted to buy a new cell phone that cost R4 739. He has only managed to save two sevenths of this amount. How much money does he still need to buy the phone?
   e) Explain to the class how your group calculated the answers.
   f) Compare your methods. How do they differ from one another?

2.37.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.6 finding fractions of whole numbers.
2.38 To use a range of strategies to check solutions\(^{38}\)

2.38.1 MATHEMATICS

2.38.2 Common and Decimal Fractions

2.38.3 Common Fractions

2.38.4 EDUCATOR SECTION

2.38.5 Memorandum

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1. To use a range of strategies to control solution
2. Own answer
3. 1.1 and 1.3 ; 1.2 and 1.4

\(^{38}\)This content is available online at <http://cnx.org/content/m30986/1.1/>.
2.38.6 LEARNER SECTION

2.38.7 Content

2.38.7.1 ACTIVITY: To use a range of strategies to check solutions [LO 1.11]

2.38.7.2 To determine the equivalence and validity of different methods [LO 2.6.1, LO 2.6.3]

1. During the previous activity you might have realised that there were more than one method for calculating an answer. Now work through the different solutions for the following problem with a partner:

1.1 The first step is to determine what \( \frac{1}{5} \) of R200 is. I therefore divide 200 by 5:

\[
\begin{array}{c|c}
5 & 200 \\
\hline
3 & 40 \\
\end{array}
\]

Table 2.47

\( \frac{1}{5} \) is equal to R40. \( \frac{3}{5} \) will be R40 x 4.

He saves R160.

1.2 I first determine what \( \frac{1}{5} \) of R200 is. Therefore: 
\[
200 \div 5 = 40
\]

\( \frac{1}{4} = 1 - \frac{1}{5} \)

I therefore subtract R40 from R200 and my answer is R160

1.3 To determine how much he saves, I have to do the following:

\[
(1. \div 5) \times 4
\]

\[
= 40 \times 4
\]

\[
= R160
\]

1.4 I calculate this as follows:

\[
200 - (200 \div 5)
\]

\[
= 200 - 40
\]

\[
= R160
\]

2. Which one of the above methods do you find easiest to do?

3. Which of the methods actually are exactly similar?

2.38.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.11:** We know this when the learner uses a range of strategies to check solutions and judge the reasonableness of solutions.

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 2.6:** We know this when the learner determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:

- 2.6.1 verbally;
- 2.6.3 by number sentences.
2.39 To find fractions of whole numbers

2.39.1 MATHEMATICS

2.39.2 Common and Decimal Fractions

2.39.3 Common Fractions

2.39.4 EDUCATOR SECTION

2.39.5 Memorandum

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1.1 402
1.2 312
1.2 695
1.4 665
1.5 1,236
1.6 1,5

39This content is available online at <http://cnx.org/content/m30987/1.1/>. 
2.39.5.1 BRAIN TEASER!

![Figure 2.39](image)

1.1

1.2 > 1

2

2.1 1

2.2 4

2.3 2

2.4 7

3

3.1 6

3.2 (\frac{1}{17}) 3.4 (\frac{3}{17})

3.3

2.39.6 LEANER SECTION

2.39.7 Content

2.39.7.1 ACTIVITY: To find fractions of whole numbers [LO 1.8.6]

1. Calculate this on your own:

1.1 \frac{3}{5} of 670

---------------------------------------

---------------------------------------

---------------------------------------

---------------------------------------

1.2 \frac{4}{7} of 526

---------------------------------------

---------------------------------------

---------------------------------------

---------------------------------------

1.3 \frac{5}{6} of 834

---------------------------------------

---------------------------------------

---------------------------------------
2.39.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.6 finding fractions of whole numbers.

2.40 To find fractions of whole numbers

2.40.1 MATHEMATICS

2.40.2 Common and Decimal Fractions

2.40.3 Common Fractions

2.40.4 EDUCATOR SECTION

2.40.5 Memorandum

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**COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)**

**LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS**

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2.40.6 LEARNER SECTION

2.40.7 Content

2.40.7.1 ACTIVITY: To find fractions of whole numbers [LO 1.8.6]

1. BRAIN TEASER!
   1.1 Neatly colour in $\frac{3}{4}$ of the following figure:

   Figure 2.40

   1.2 Why are you not able to colour in $\frac{3}{2}$ of the figure?
   2. Supply the correct answer:

   • What fraction of 60c is represented by 15c?
   • What fraction of R5.00 is represented by R1.20?
• What fraction of R10 is represented by R4,50?
• What fraction of R45 is represented by R17,50?

3. Use different colours to divide the figure as follows:
   3.1 two equal parts (blue)
   3.2 three equal parts (green)
   3.3 four equal parts (purple)
   3.4 six equal parts (orange)

Figure 2.41

TIME FOR SELF-ASSESSMENT

<table>
<thead>
<tr>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have improved my marks in the second mental calculation test. (LO 1.9)</td>
</tr>
<tr>
<td>I am able to calculate fractions of given amounts. (LO 1.8)</td>
</tr>
<tr>
<td>I found the brain teasers easy to do. (LO 1.8)</td>
</tr>
</tbody>
</table>

Figure 2.42

2.40.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.
Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:
1.8.6 finding fractions of whole numbers.

2.41 To record data

2.41.1 MATHEMATICS

2.41.2 Common and Decimal Fractions

2.41.3 Common Fractions

2.41.4 EDUCATOR SECTION

2.41.5 Memorandum

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\[\text{This content is available online at } <\text{http://cnx.org/content/m30989/1.1/}>.\]
2.41.6 LEANER SECTION

2.41.7 Content

2.41.7.1 ACTIVITY: To record data [LO 5.1, LO 5.2, LO 5.4]

2.41.7.2 To draw graphs and interpret data [LO 5.6]

** This activity is for inclusion in your portfolio. Work neatly and consider the assessment grid before you start.

1. Find out at home what fraction of your parents’ income is spent on:
   1.1 food:
   1.2 housing:
   1.3 electricity and water:
   1.4 telephone:
   1.5 motor car/s:

   • recreation (eating out, cinema, etc.):

2. Draw a table and represent the above information as neatly as possible.
3. Now draw a pie chart to show this information:

2.41.7.2.1 ASSESSMENT: SALAR Y AND FRA CTIONS

1. = not at all
2. = just a little
3. = good
4 = outstanding

<table>
<thead>
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<th>CRITERIA</th>
<th>CODE</th>
</tr>
</thead>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>Completeness</td>
<td>Hardly any of the instructions have been carried out.</td>
</tr>
<tr>
<td>Table</td>
<td>This was not done at all.</td>
</tr>
<tr>
<td>Graph</td>
<td>This was not done at all.</td>
</tr>
</tbody>
</table>

Table 2.48

2.41.8 Assessment

*Learning Outcome 5:* The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.
Assessment Standard 5.1: We know this when the learner poses simple questions about school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

Assessment Standard 5.2: We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher, class and self;

Assessment Standard 5.4: We know this when the learner organises and records data, using tallies and tables;

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped).

2.42 Test

2.42.1 MATHEMATICS

2.42.2 Common and Decimal Fractions

2.42.3 Common Fractions

2.42.4 EDUCATOR SECTION

2.42.5 Memorandum

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TEST 1

1. Fill in the missing words:
   1.1 Improper
   1.2 Mixed number
   2.1 \( \frac{20}{27} \) 2.2 \( \frac{5}{6} \)
   3. Fill in: < ; > or = :
   3.1 = 3.2 >
   4. Simplify:
   4.1 \( \frac{16}{20} \) 4.2 \( \frac{3}{4} \)
   5. Calculate:
   5.1 \( = \frac{10}{3} + \frac{5}{6} \) 5.2 \( 1 \frac{7}{8} \)
   = \( \frac{11}{9} \)
   5.3 2 476
   6. \( x = \frac{1}{8} + \frac{4}{9} \)
   = +
   7. \( y = \frac{3}{5} \times \frac{1025}{1} \)
   = 615 km

2.42.6 LEARNER SECTION

2.42.7 Content

2.42.7.1 TEST 1

1. Fill in the missing words:
   1.1 \( \frac{16}{20} \) is known as a ........................................ fraction.
   1.2 We refer to \( \frac{1}{4} \) as a ................................................ (2)

2. Fill in the missing numbers:
   2.1 \( \frac{5}{7} = \frac{20}{22} 2 \frac{35}{42} = \frac{5}{6} \)
   (2)

3. Fill in: < ; > or = :
   3.1 \( \frac{16}{20} \) .......................... \( \frac{5}{6} \) 3.2 \( \frac{4}{5} \) .......................... \( \frac{3}{4} \)
   (2)

4. Simplify:
   4.1 \( \frac{32}{35} \) 4.2 \( \frac{45}{60} \)
   (2)

5. Calculate:
   5.1 \( \frac{7}{3} + 3 \frac{2}{3} \)
   (3)
   5.2 \( 6 \frac{1}{2} - 4 \frac{5}{8} \)
   (3)
   5.3 \( \frac{4}{5} \) of \( 3 005 \)
6. Janine saves one sixth of her pocket money and Zade saves four ninths of his. What is the combined fraction of their saved pocket money?

7. Dad has to travel 1025 km. He only completes three fifths of the distance. How many km has he travelled?

2.43 To recognise the place values of digits

2.43.1 MATHEMATICS

2.43.2 Common and Decimal Fractions

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HOW WELL DO YOU REMEMBER THIS?

• decimals
• comma
• tenths
• second
• thousand
• point

1. 300
2. \( \frac{7}{10} \)
3. \( \frac{9}{100} \)
4. \( \frac{5}{100} \)

2.43.6 LEARNER SECTION

2.43.7 Content

2.43.7.1 HOW WELL DO YOU REMEMBER THIS?

You have already come into contact with decimal fractions in Grades 4 and 5. Let’s see how much you remember!

Find the answers in the grid and circle them neatly:

• 0.89 is referred to as a fraction.
• The decimal separates whole numbers.
• The first figure/digit following the comma represents .
• The figure/digit after the comma represents hundredths.
• The third figure/digit after the comma represents ...................................ths.
• On a pocket calculator, the decimal comma is shown by means of a .

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Table 2.49

LET’S DO REVISION!
2.43.7.2 ACTIVITY: To recognise the place values of digits [LO 1.4.2]

It is important to know the value of each digit in a decimal number to be able to perform calculations correctly when working with decimal fractions. Let’s see whether you are able to do these correctly, describing the value of the underlined digits.

1. 326,43
2. 48,796
3. 86,549
4. 296,85

2.43.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.4: We know this when the learner recognises the place value of digits in:

1.4.2 decimal fractions to at least 2 decimal places.

2.44 To recognise and classify numbers in order to describe and compare them

2.44.1 MATHEMATICS

2.44.2 Common and Decimal Fractions

2.44.3 Common Fractions

2.44.4 EDUCATOR SECTION

2.44.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:
1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.

44This content is available online at <http://cnx.org/content/m30996/1.1/>. 
• Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
• It should be possible to work through the module in 3 weeks.
• ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

• ** LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
• This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.
• ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

<table>
<thead>
<tr>
<th>SQUARE</th>
<th>AMOUNT</th>
<th>FRACTION</th>
<th>DECIMAL FRACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>$\frac{1}{10}$</td>
<td>0,1</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>$\frac{12}{100}$ or $\frac{3}{25}$</td>
<td>0,12</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>$\frac{66}{100}$ or $\frac{3}{5}$</td>
<td>0,6</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>$\frac{9}{100}$</td>
<td>0,09</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>$\frac{7}{100}$</td>
<td>0,07</td>
</tr>
</tbody>
</table>

Figure 2.43

2.44.6 LEARNER SECTION

2.44.7 Content

2.44.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.4.2]

In Grade 5 you learned to write fractions as decimal fractions. Take a good look at the following and then complete the table:
Figure 2.44

Figure 2.45
2.44.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.4:** We know this when the learner recognises the place value of digits in:

1.4.2 decimal fractions to at least 2 decimal places.

2.45 To use a range of techniques to perform calculations

2.45.1 MATHEMATICS

2.45.2 Common and Decimal Fractions

2.45.3 Common Fractions

2.45.4 EDUCATOR SECTION

2.45.5 Memorandum

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3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
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- Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
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** LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

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45This content is available online at <http://cnx.org/content/m30998/1.1/>. 
• ** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

\[
1.1 \quad 8 + \frac{4}{10} + \frac{7}{100} + \frac{2}{1000}
\]
\[
1.2 \quad 10 + 3 + \frac{8}{10} + \frac{3}{100}
\]
\[
1.3 \quad 400 + 20 + 6 + \frac{9}{10}
\]

2. 
1.2.1 204.35
1.2.2 21,739
1.2.3 20,405
1.2.4 32.041

2.45.6 LEARNER SECTION

2.45.7 Content

2.45.7.1 ACTIVITY: To use a range of techniques to perform calculations [LO 1.10.3]

1. If you are able to recognise the place values of the different digits (see Activity 2.1), the following activity should be child’s play for you! Look carefully at each digit in the following numbers and then write them in extended notation:

- 8,472:
- 13,83:
- 426.9:

2. What number is represented below?

---

\[\text{Figure 2.46}\]
2.45.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:
1.10.3 building up and breaking down numbers.

2.46 To recognise and classify numbers in order to describe and compare them

2.46.1 MATHEMATICS

2.46.2 Common and Decimal Fractions

2.46.3 Common Fractions

2.46.4 EDUCATOR SECTION

2.46.5 Memorandum

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5. Geometry; Data handling and Probability

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 Focuses on Common Fractions

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- LEARNING UNIT 2 Focuses on Decimal Fractions
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.

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46This content is available online at [http://cnx.org/content/m30999/1.1/].
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.35 1.53 1.77 2.09

2.46.6 LEANER SECTION

2.46.7 Content

2.46.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.2]

1. You already know that number lines help us see where specific numbers fit in. Look carefully at the number lines and neatly write down the numbers that have been left out:

2.47 T o recognise and classify numbers in order to describe and compare them

2.47.1 MATHEMATICS

2.47.2 Common and Decimal Fractions

2.47.3 Common Fractions

2.47.4 EDUCATOR SECTION

2.47.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:
1. Number concept, Addition and Subtraction
2. Multiplication and Division

47This content is available online at <http://cnx.org/content/m31001/1.1/>.
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and /or language skills in a variety of ways) is addressed.
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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
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**Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

<table>
<thead>
<tr>
<th>COMMON FRACTION</th>
<th>$\frac{1}{2}$</th>
<th>$\frac{1}{4}$</th>
<th>$\frac{3}{4}$</th>
<th>$\frac{4}{5}$</th>
<th>$\frac{1}{8}$</th>
<th>$\frac{1}{20}$</th>
<th>$\frac{3}{8}$</th>
<th>$\frac{5}{8}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECIMAL FRACTION</td>
<td>0,5</td>
<td>0,25</td>
<td>0,75</td>
<td>0,8</td>
<td>0,125</td>
<td>0,2</td>
<td>0,375</td>
<td>0,625</td>
</tr>
</tbody>
</table>

Table 2.50

BRAIN TEASER

- 0,6 repeating
- 0,16 (6 repeating)
- 0,1 repeating

2.47.6 LEARNER SECTION

2.47.7 Content

2.47.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.2, LO 1.3.3]

1. A last bit of revision! Write the common fractions as decimal fractions and vice versa. Remember to complete the table neatly!
### Table 2.51

<table>
<thead>
<tr>
<th>COMMON FRACTION</th>
<th>$\frac{1}{2}$</th>
<th>$\frac{4}{5}$</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DECIMAL FRACTION</td>
<td>0,5</td>
<td>0,75</td>
<td>0,125</td>
<td>0,625</td>
</tr>
</tbody>
</table>

### 2.47.7.1.1 BRAIN TEASER!

Write the following as a decimal fraction – remember to use brief notation!

$$\frac{2}{3}$$

### 2.47.8 Assessment

**Learning Outcome 1:** Die leerder is in staat om getalle en die verwantskappe daarvan te herken, te beskryf en voor te stel, en om tydens probleemoplossing bevoeg en met selfvertroue te tel, te skat, te bereken en te kontroleer.

**Assessment Standard 1.3:** We know this when the learner recognises and represents the following numbers in order to describe and compare them:
1. 3.2 decimal fractions to at least two decimal places;
2. 3.3 common fractions, including specifically tenths, hundreds and percentages.

### 2.48 To perform mental calculations

#### 2.48.1 MATHEMATICS

#### 2.48.2 Common and Decimal Fractions

#### 2.48.3 Common Fractions

#### 2.48.4 EDUCATOR SECTION

#### 2.48.5 Memorandum

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**COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)**

**LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS**

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.

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48This content is available online at <http://cnx.org/content/m31006/1.1/>.
• Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
• Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
• It should be possible to work through the module in 3 weeks.
• **Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

**LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS**
• This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

**Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.**

1.1 45
1.2 18
1.3 1 984
1.4 8
1.5 10
1.6 12
1.7 45

9

1.9 7
1.10 7
1.11 8
1.12 125
1.13 3
1.14 \frac{76}{100}
1.15 \frac{93}{100}

2.48.6 LEARNER SECTION

2.48.7 Content

2.48.7.1 ACTIVITY: To perform mental calculations [LO 1.9]

1. Are you able to complete the following mental calculation test in three minutes?
Ek het reg!

2.48.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations.

2.49 To count forwards and backwards in decimal fractions

### 2.49.1 MATHEMATICS

#### 2.49.2 Common and Decimal Fractions

#### 2.49.3 Common Fractions

#### 2.49.4 EDUCATOR SECTION

#### 2.49.5 Memorandum

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**COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)**

**LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS**

---

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>19 + 15 + 11 = ..............</td>
</tr>
<tr>
<td>1.2</td>
<td>35 - 17 = ....................</td>
</tr>
<tr>
<td>1.3</td>
<td>2 003 - 19 = ..................</td>
</tr>
<tr>
<td>1.4</td>
<td>9 x .................. = 72</td>
</tr>
<tr>
<td>1.5</td>
<td>.................. x 5 = 50</td>
</tr>
<tr>
<td>1.6</td>
<td>7 x .................. = 84</td>
</tr>
<tr>
<td>1.7</td>
<td>........................... = 9 = 5</td>
</tr>
<tr>
<td>1.8</td>
<td>36 ÷ 9 = 4</td>
</tr>
<tr>
<td>1.9</td>
<td>35 ÷ 5 =</td>
</tr>
<tr>
<td>1.10</td>
<td>(4 x 7) + = 35</td>
</tr>
<tr>
<td>1.11</td>
<td>(5 x ) - 9 = 31</td>
</tr>
<tr>
<td>1.12</td>
<td>................................ = 84</td>
</tr>
<tr>
<td>1.13</td>
<td>9/20 = 0,</td>
</tr>
<tr>
<td>1.14</td>
<td>1,75 = 1</td>
</tr>
</tbody>
</table>

**Table 2.52**

---

<http://cnx.org/content/m31014/1.1/>
This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.

Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.

Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.

It should be possible to work through the module in 3 weeks.

** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.

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2.49.6 LEANER SECTION

2.49.7 Content

2.49.7.1 ACTIVITY: To count forwards and backwards in decimal fractions [LO 1.1]

2.49.7.1.1 Let’s count!

1. You’ll need a partner and a pocket calculator. Take turns. One partner has to count out loud while the other one refers to the calculator to check. (Remember that the calculator has to be programmed first!)

   Count in intervals of:
   1.1 0,1 from 10 to 0.
   1.2 0,2 from 5,4 to 10,6.
   1.3 0,04 from 0 to 0,48.
   1.4 0,01 from 7 to 6,88.
   1.5 0,003 from 0 to 0,036.
   1.6 0,001 from 5 to 4,985.

2.49.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.1: We know this when the learner counts forwards and backwards in decimals.
2.50 To investigate and extend numerical patterns\textsuperscript{50}

2.50.1 MATHEMATICS

2.50.2 Common and Decimal Fractions

2.50.3 Common Fractions

2.50.4 EDUCATOR SECTION

2.50.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 0,0009 ; 0,01 ; 0,011 ; 0,021
1.2 0,024 ; 0,023 ; 0,022 ;
1.3 0,75 ; 1 ; 1,25 ; 1,5
1.4 0,015 ; 0,02 ; 0,025 ; 0,03
1.5 4,25 ; 4 ; 3,75 ; 3,5
1.6 2,65 ; 2,475 ; 2,3 ; 2,125

\textsuperscript{50}This content is available online at <http://cnx.org/content/m31015/1.1/>.
2.50.6 LEANER SECTION

2.50.7 Content

2.50.7.1 ACTIVITY: To investigate and extend numerical patterns [LO 2.1.2]

1. Take a careful look at the following numbers. Say each out loud. Then try to see the pattern. If you are able to do it, complete the number patterns in writing without using your pocket calculator. Ask your educator for assistance if you struggle to do it:
   
   1.1 0,007; 0,008; ....................; ....................; ....................; ....................
   
   • 0,026; 0,025; ....................; ....................; ....................; ....................
   
   1.3 0,25; 0,5; ....................; ....................; ....................; ....................
   
   1.4 0,005; 0,010; ....................; ....................; ....................; ....................
   
   1.5 4,75; 4,5; ....................; ....................; ....................; ....................
   
   1.6 3; 2,825; ....................; ....................; ....................; ....................

2. Check your answers with the help of a pocket calculator.

2.50.8 Assessment

Learning Outcome 2: The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standard 2.1: We know this when the learner investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:

2.1.2 investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns.

2.51 To recognise and classify numbers in order to describe and compare them

2.51.1 MATHEMATICS

2.51.2 Common and Decimal Fractions

2.51.3 Common Fractions

2.51.4 EDUCATOR SECTION

2.51.5 Memorandum

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51This content is available online at <http://cnx.org/content/m31017/1.1/>.
COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

**Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.**

1.1 False
1.2 True
1.3 False
1.4 False
1.5 True
1.6 True
1.7 True
1.8 False
1.9 False
1.10 True

2.51.6 LEARNER SECTION

2.51.7 Content

2.51.7.1 ACTIVITY: To recognise and classify numbers in order to describe and compare them [LO 1.3.2]

2.51.7.1.1 COMPETITION TIME!

1. Form groups of four. You are allowed one minute only to decide whether each of the following is true or false. Your educator will then provide the correct answer.

1.1 $0.1 < 0.02$
1.2 $1 > 0.99$
1.3 $0.4 < 0.06$
1.4 $0.3 < 0.30$
1.5 $0.7 > 0.071$
1.6 $1.04 = 1.040$
1.7 $0.49 < 0.5$
1.8 $0.042 > 0.42$
1.9 0.057 < 0.13
1.10 3.8 = 3.800

- Which group has won? .................................................................

How many answers did YOUR group get right? ..............................

TIME FOR SELF-ASSESSMENT

It is very important that you understand and feel that you are in control concerning the work we have done so far. Show us how you feel about it by assessing yourself on a scale of 1 - 4. Read the criteria and circle the appropriate number:

1 = needs attention (struggling)
2 = fairly good (coping)
3 = very good (fairly confident)
4 = outstanding (fully confident)

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was able to find the correct answer on p. 27.</td>
<td>1</td>
</tr>
<tr>
<td>I am able to name the value of the underlined digit in a number.</td>
<td>1</td>
</tr>
<tr>
<td>I am able to write fractions as decimal fractions.</td>
<td>1</td>
</tr>
<tr>
<td>I am able to write decimal numbers in extended notation.</td>
<td>1</td>
</tr>
<tr>
<td>I am able to take readings from a number line and write them down correctly (LO 1.3)</td>
<td>1</td>
</tr>
<tr>
<td>I am able to write decimal fractions as common fractions. (LO 1.3)</td>
<td>1</td>
</tr>
</tbody>
</table>

*continued on next page*
I am able to programme my pocket calculator to count in decimal intervals. (LO 1.10)

| 1 | 2 | 3 | 4 |

I am able to count on in decimal intervals. (LO 1.1)

| 1 | 2 | 3 | 4 |

I am able to count backwards in decimal intervals. (LO 1.1)

I am able to correctly compare fractions with one another and to fill in the correct relationship signs.

| 1 | 2 | 3 | 4 |

Table 2.53

2.51.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.3: We know this when the learner recognises and represents the following numbers in order to describe and compare them:

1.3.2 decimal fractions to at least two decimal places.

2.52 To use a range of techniques to perform calculations

2.52.1 MATHEMATICS

2.52.2 Common and Decimal Fractions

2.52.3 Common Fractions

2.52.4 EDUCATOR SECTION

2.52.5 Memorandum

INTRODUCTION

The learning programme for grade six consists of five modules:

1. Number concept, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

This content is available online at <http://cnx.org/content/m31029/1.1/>.
• It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

• This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
• Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
• Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
• It should be possible to work through the module in 3 weeks.
• **Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

• This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

**Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.2 a) 6,4
   b) 2,6
   c) 1
   d) 5,3
   e) 4,3
   f) 3,9

1.3 thousandths
   hundredth a hundredth

1.4 0,261 = 0,26
   0,935 = 0,94
   3,478 = 3,48
   0,955 = 0,96
   4,227 = 4,23
   2,132 = 2,13

BRAIN TEASER!
1.5 a) 4,263
   b) 5,145
   c) 2,512
   d) 6,329
   e) 1,835
   f) 3,490
2.52.6 LEANER SECTION

2.52.7 Content

2.52.7.1 ACTIVITY: To use a range of techniques to perform calculations [LO 1.10.4]

ROUNDING:

1. Take a good look at these newspaper headlines:

![Image of newspaper headlines](Figure 2.48)

These numbers have all been rounded. Let’s see how decimal numbers can be rounded!

1.1 Work with a friend to examine the following flow chart. Be sure that you understand what it tells you. Then explain it to the rest of the class.

![Image of rounding flow chart](Figure 2.49)

1.2 Round the following off to one position after the decimal comma (one tenth):
1.3 Work with a friend to see whether you are able to fill in the missing words!

E.g.

1.4 Round the following to the nearest hundredth (two positions after the decimal comma) and link each with its rounded off partner.

E.g.
1.5. **BRAIN TEASER!**

Are you able to round off the following to the nearest thousandths? (three positions after the decimal comma)

a) 4,2634  

b) 5,1447  

c) 2,5121  

d) 6,3286  

e) 1,8353  

f) 3,4895

---

2.52.8 **Assessment**

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.10:** We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:

1.10.4 rounding off and compensating.
2.53 To recognise and use equivalent forms of decimal fractions

2.53.1 MATHEMATICS

2.53.2 Common and Decimal Fractions

2.53.3 Common Fractions

2.53.4 EDUCATOR SECTION

2.53.5 Memorandum

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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

2.1 =
2.2 <
2.3 <
2.4 <
2.5 =

\[This\ content\ is\ available\ online\ at\ \texttt{http://cnx.org/content/m31036/1.1/}.\]
2.6 =  
2.7 <  
2.8 <  
2.9 <  
2.10 <  

2.53.6 LEANER SECTION

2.53.7 Content

2.53.7.1 ACTIVITY: To recognise and use equivalent forms of decimal fractions [LO 1.5.2]

ARRANGEMENT OF DECIMAL AND COMMON FRACTIONS

Earlier in the module you had to decide whether relationship signs were filled in correctly. Work with a friend to examine the following question and the solutions:

1. Two painters wanted to know who was painting the longer wall: one wall measured 9.3 m and the other 9 1/4 m.

   - x 4 I work it out like this: 9.3 = 9 3/10 = 93/10
   
   x 10 9 3/10 = 93/10
   x 10 9 1/4 = 9 25/4 = 9 25/40
   x 10 9 1/4 = 9 2 5/4 = 9 25/10
   The 9.3 m wall is longer.

<table>
<thead>
<tr>
<th>E</th>
<th>t</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 2.52

1.2 I first change the 9 1/4 m to a decimal fraction.

   - x 25x 25 9 1/4 = 9.25  
   9.3 = 9.25/10

   Whose method do you prefer?

   - Why?

   .................................................................................................................
   .................................................................................................................
   .................................................................................................................
   .................................................................................................................

2. ANOTHER COMPETITION!

This time the girls are competing against the boys! You now have two minutes to fill in the correct relationship sign. Your educator will then ask any boy or girl to read out the right answers.
2.1 0.09 $\frac{9}{100}$
2.2 4.02 $\frac{402}{100}$
2.3 0.016 $\frac{16}{1000}$
2.4 0.8
2.5 0.20 $\frac{1}{5}$
2.6 1.4 $\frac{14}{10}$
2.7 3.22
2.8 0.494
2.9 2.006 $\frac{2006}{1000}$
2.10 0.025 $\frac{1}{4}$

- Who has won this time?
- How many of your answers are correct?

2.53.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.5:** We know this when the learner recognises and uses equivalent forms of the numbers listed above, including:
1.5.2 decimal fractions to at least 2 decimal places.

2.54 To calculate by selecting operations appropriate to solving problems

2.54.1 MATHEMATICS

2.54.2 Common and Decimal Fractions

2.54.3 Common Fractions

2.54.4 EDUCATOR SECTION

2.54.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)
LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

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54This content is available online at <http://cnx.org/content/m31037/1.1/>. 
• This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
• Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
• Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
• It should be possible to work through the module in 3 weeks.
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• This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

<table>
<thead>
<tr>
<th></th>
<th>1.1 15,549</th>
<th>1.2 23,866</th>
<th>1.3 25,909</th>
<th>1.4 121,301</th>
<th>1.5 149,869</th>
</tr>
</thead>
</table>

2.54.6 LEARNER SECTION

2.54.7 Content

2.54.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.8]

1. Complete the table:

<table>
<thead>
<tr>
<th></th>
<th>CALCULATION</th>
<th>ESTIMATION</th>
<th>POCKET CALCULATOR ANSWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.g.</td>
<td>1,8 + 3,026</td>
<td>2 + 3 = 5</td>
<td>4,826</td>
</tr>
<tr>
<td>1.1</td>
<td>3,049 + 12,5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>9,876 + 13,99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>0,009 + 25,9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.54

2.54.7.1.1 ADDITION AND SUBTRACTION

DO YOU KNOW THIS?

When we have to add or subtract decimal fractions, it is wise to first estimate the answer by rounding off to the nearest whole number.
2.54.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.8 addition and subtraction of positive decimals with at least 2 decimal places.

2.55 To calculate by selecting operations appropriate to solving problems

2.55.1 MATHEMATICS

2.55.2 Common and Decimal Fractions

2.55.3 Common Fractions

2.55.4 EDUCATOR SECTION

2.55.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

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- **LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS**
- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.

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\[55\] This content is available online at <http://cnx.org/content/m31038/1.1/>.
As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1. 165,2 ℓ
2. 372,564
3. 56,42 kg
4. 147,431 m
5. and 6. Own explanation

### 2.55.6 LEARNER SECTION

### 2.55.7 Content

#### 2.55.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.8]

You have to work in groups of three for the following activity. Ask the educator for the paper that you will need. Read through the problems attentively and try to find the answers. Remember to show the operations that you use!

1. Mr Katlego has had to put petrol into his minibus on three occasions this month, to transport passengers. He first put in 59,81 litres, then 48,65 litres and finally another 56,75 litres. How many litres of petrol have been put into his minibus this month?
2. What is the difference between 900 and 527,436?
3. Didi was very overweight and decided to take action. Before dieting, she weighed 143,21 kg. After a few months she weighed 86,79 kg. How many kg has Didi lost?
4. Mr Naidoo has decided to take his class to the game park. The following interesting information was derived from this visit:

<table>
<thead>
<tr>
<th>10 animals</th>
<th>Length/Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zebras</td>
<td>15,3m</td>
</tr>
<tr>
<td>Giraffes</td>
<td>56,08m</td>
</tr>
<tr>
<td>Ostriches</td>
<td>23,158m</td>
</tr>
<tr>
<td>Elephants</td>
<td>38m</td>
</tr>
<tr>
<td>Hippopotamuses</td>
<td>14,893m</td>
</tr>
</tbody>
</table>

Table 2.55

If you stacked all these animals on top of one another, how high would they be?
5. Explain to the rest of the class how your group calculated the answers.
6. Compare your methods. How do they differ from one another?

** TIME FOR SELF-ASSESSMENT **

Assess your work on a scale of 1 - 4 by circling the appropriate number:

1 = not at all
2 = just a little
3 = good
4 = outstanding
CRITERIA | CODE
--- | ---
All group members participated in the activity. | 1 2 3 4
Group members listened to one another. | 1 2 3 4
Group members helped and encouraged each other. | 1 2 3 4
Group members adhered to the instructions | 1 2 3 4
Each one had a chance to speak. | 1 2 3 4
The group’s work was neatly done. | 1 2 3 4
The answers were calculated correctly. | 1 2 3 4

Table 2.56

DO YOU REMEMBER THIS?
When we add and subtract decimal fractions, we could write the numbers below one another and add or subtract normally. The commas, however, have to be exactly in line to ensure that the answer is correct.

E.g. \( x = 19,046 + 3,49 + 127,6 \)

1 9 , 0 4 6
3 , 4 9
+ 1 2 7 , 6
1 4 0 , 1 3 6

2.55.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.8: We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.8 addition and subtraction of positive decimals with at least 2 decimal places.

2.56 To calculate by selecting operations appropriate to solving problems

2.56.1 MATHEMATICS

2.56.2 Common and Decimal Fractions

2.56.3 Common Fractions

2.56.4 EDUCATOR SECTION

2.56.5 Memorandum

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1.1 374,019
1.2 613,44
1.3 78,721
14 388,76
BRAIN TEASER!
2.4 200 ; 290 ; 3 ; 10,02 ; 2,1 ; 2,5 ; 3,02
3. Numbers within the square are equal to double those in the circle

2.56.6 LEANER SECTION

2.56.7 Content

2.56.7.1 ACTIVITY: To calculate by selecting operations appropriate to solving problems [LO 1.8.8]

1. Now that you know how to add and subtract decimal fractions, you can tackle the following activity. Work on your own. Calculate the following without using your pocket calculator:

1.1 208,96 + 32,459 + 132,6
1.2 458,843 + 56,397 + 98,2
1.3 143,96 - 65,239
1.4 541,23 - 152,47

2. BRAIN-TEASER!
Select any one of the numbers in the circle.

- Add 7,5 to this number.
- Double your answer.
• Subtract 15 from the answer.
Write your answer in the square.

![Figure 2.53](image1)

• Do exactly the same with each of the other numbers in the circle.

3. What do you notice when you examine the answers?

**2.56.7.1.1 TIME FOR SELF-ASSESSMENT**

Colour the appropriate block:

![Figure 2.54](image2)
2.56.8

2.56.9 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.8 addition and subtraction of positive decimals with at least 2 decimal places.

2.57 To perform mental calculations

2.57.1 MATHEMATICS

2.57.2 Common and Decimal Fractions

2.57.3 Common Fractions

2.57.4 EDUCATOR SECTION

2.57.5 Memorandum

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57 This content is available online at <http://cnx.org/content/m31042/1.1/>.
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

**Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

```
1.1 12
1.2 8
1.3 4 000
1.4 1 186
1.5 254,5
1.6 1 350
1.7 9 900
1.8 132
1.9 0,87
1.10 0,77
1.11 0,808
1.12 2,62
1.13 2,25
1.14 0,514
1.15 9,45
```

### 2.57.6 LEANER SECTION

### 2.57.7 Content

#### 2.57.7.1 ACTIVITY: To perform mental calculations [LO 1.9.1]

1. Before we continue, we are going to establish how well you manage addition and subtraction of decimal fractions. Complete the following mental calculation test as quickly and accurately as possible:

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 ................. x 9 = 108</td>
<td></td>
</tr>
<tr>
<td>1.2 (6 × .................) + 9 = 57</td>
<td></td>
</tr>
<tr>
<td>1.3 4 x 10(^3) = ...................</td>
<td></td>
</tr>
<tr>
<td>1.4 Halve 593:</td>
<td></td>
</tr>
<tr>
<td>1.5 Double 509:</td>
<td></td>
</tr>
<tr>
<td>1.6 1 276 + 74 =</td>
<td></td>
</tr>
<tr>
<td>1.7 10(^4) - 10(^2) =</td>
<td></td>
</tr>
<tr>
<td>1.8 ÷ 11 = 12</td>
<td></td>
</tr>
<tr>
<td>1.9 0,6 ÷ 0,27 =</td>
<td></td>
</tr>
<tr>
<td>1.10 0,45 + 0,32 =</td>
<td></td>
</tr>
<tr>
<td>1.11 0,098 + 0,71 =</td>
<td></td>
</tr>
<tr>
<td>1.12 2,7 ÷ 0,08 =</td>
<td></td>
</tr>
<tr>
<td>1.13 3,5 - 1,25 =</td>
<td></td>
</tr>
<tr>
<td>1.14 1 - 0,486 =</td>
<td></td>
</tr>
<tr>
<td>1.15 10 - 0,55 =</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.57

### 2.57.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations involving:

1.9.1 addition and subtraction.
2.58 To describe observed rules in your own words

2.58.1 MATHEMATICS

2.58.2 Common and Decimal Fractions

2.58.3 Common Fractions

2.58.4 EDUCATOR SECTION

2.58.5 Memorandum

INTRODUCTION

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3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

- It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

- This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
- Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
- Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
- It should be possible to work through the module in 3 weeks.
- ** Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
- As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

- 1. 10,2 ; 9 ; 3 ; 4,5 ; 20,41 ; 34,8 ; 3,68
- 2. 2.1 shifted one position to the left

58 This content is available online at <http://cnx.org/content/m31043/1.1/>. 
2.2 shifted one position to the right
3.
3.1 30
90
45
348
102
36.8
204.1
3.2 shifted two positions to the right
3.3 shifted two positions to the left
4.1

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>0.3</th>
<th>0.9</th>
<th>0.45</th>
<th>3.48</th>
<th>0.368</th>
<th>2.041</th>
</tr>
</thead>
<tbody>
<tr>
<td>x 1 000</td>
<td>300</td>
<td>900</td>
<td>450</td>
<td>3 480</td>
<td>368</td>
<td>2 041</td>
</tr>
</tbody>
</table>

Table 2.58

• shifted three positions to the right

2.58.6 LEANER SECTION

2.58.7 Content

2.58.7.1 ACTIVITY: To describe observed rules in your own words [LO 2.2]

2.58.7.2 To determine output values for given input values [LO 2.3.1]

1. Let’s see what happens when we multiply decimal fractions by 10 and multiples of 10. Work with a partner. Find the answers to the following with the help of a pocket calculator:
2. Answer the following questions:

2.1 What has happened in the case of the tenths digit?
2.2 What has happened in the case of the decimal symbol (comma)?

3. Complete the flow chart with the help of a pocket calculator:

![Flow chart image]

Figure 2.56
• What has happened here in the case of the decimal comma?

• What has happened in the case of the hundredths digit?

4.

• Use your pocket calculator and work with a partner to complete the table.

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>0,3</th>
<th>0,9</th>
<th>0,45</th>
<th>3,48</th>
<th>0,368</th>
<th>2,041</th>
</tr>
</thead>
<tbody>
<tr>
<td>x 1 000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.59

• What has happened in the case of the decimal comma?

2.58.7.2.1 REMEMBER!

When we multiply a decimal fraction by 10, the decimal comma is shifted one position to the right.

When we multiply a decimal fraction by 100, the decimal comma is shifted two positions to the right.

When we multiply a decimal fraction by 1 000, the decimal comma moves three positions to the right.

2.58.8 Assessment

*Learning Outcome 2:* The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

*Assessment Standard 2.2:* We know this when the learner describes observed relationships or rules in own words;

*Assessment Standard 2.3:* We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.1 verbal descriptions;

2.59 To describe observed rules in your own words59

2.59.1 MATHEMATICS

2.59.2 Common and Decimal Fractions

2.59.3 Common Fractions

2.59.4 EDUCATOR SECTION

2.59.5 Memorandum

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3. Fractions and Decimal fractions
4. Measurement and Time
5. Geometry; Data handling and Probability

59This content is available online at <http://cnx.org/content/m31045/1.1/>.
• It is important that educators complete the modules in the above sequence, as the learners will require the knowledge and skills acquired through a previous module to be able to do the work in any subsequent module.

COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS
• This module continues the work dealt with in grade 5. Addition and subtraction of fractions are extended and calculation of a fraction of a particular amount is revised.
• Check whether the learners know the correct terminology and are able to use the correct strategies for doing the above correctly.
• Critical outcome 5 (Communicating effectively by using visual, symbolic and/or language skills in a variety of ways) is addressed.
• It should be possible to work through the module in 3 weeks.
• **Activity 17 is designed as a portfolio task. It is a very simple task, but learners should do it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
• This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
• As learners usually have difficulty with the latter, you could allow 3 to 4 weeks for this section of the work.

**Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

<table>
<thead>
<tr>
<th>DECIMAL FRACTION</th>
<th>÷ 10</th>
<th>÷ 100</th>
<th>÷ 1 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,3</td>
<td>0,03</td>
<td>0,003</td>
<td>0,0003</td>
</tr>
<tr>
<td>0,9</td>
<td>0,09</td>
<td>0,009</td>
<td>0,0009</td>
</tr>
<tr>
<td>0,45</td>
<td>0,045</td>
<td>0,0045</td>
<td>0,00045</td>
</tr>
<tr>
<td>3,48</td>
<td>0,348</td>
<td>0,00348</td>
<td>0,000348</td>
</tr>
<tr>
<td>1,02</td>
<td>0,102</td>
<td>0,0102</td>
<td>0,00102</td>
</tr>
<tr>
<td>0,368</td>
<td>0,0368</td>
<td>0,00368</td>
<td>0,000368</td>
</tr>
<tr>
<td>2,041</td>
<td>0,2041</td>
<td>0,02041</td>
<td>0,002041</td>
</tr>
</tbody>
</table>

Table 2.60

2.1 one position to the left
2.2 two position to the left
2.3 three position to the left

2.59.6 LEARNER SECTION

2.59.7 Content
2.59.7.1 ACTIVITY: To describe observed rules in your own words [LO 2.2]
2.59.7.2 To determine output values for given input values [LO 2.3.3]

1. A CHALLENGE!
Form groups of three for this exercise. Use exactly the same numbers as in 3.1 and first divide them by 10, then by 100 and finally by 1 000. (You may make use of a pocket calculator).

Complete the table:

<table>
<thead>
<tr>
<th>DECIMAL FRACTION</th>
<th>÷ 10</th>
<th>÷ 100</th>
<th>÷ 1 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.368</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.041</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.61

2. See whether you are able to complete the following sentences:
2.1 When we divide a decimal fraction by 10 the decimal comma is shifted

- When we divide a decimal fraction by 100 the decimal comma is shifted
- When we divide a decimal fraction by 1 000 the decimal comma is shifted

TIME FOR SELF-ASSESSMENT
It is important to be sure that you understand the work done so far. Show to what extent you have mastered it by reading the criteria and colouring the appropriate face.
2.59.8 Assessment

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 2.2:** We know this when the learner describes observed relationships or rules in own words;

**Assessment Standard 2.3:** We know this when the learner determines output values for given input values, or input values for given output values, using:

2.3.3 tables.
2.60 To use a range of techniques to perform calculations

2.60.1 MATHEMATICS

2.60.2 Common and Decimal Fractions

2.60.3 Common Fractions

2.60.4 EDUCATOR SECTION

2.60.5 Memorandum

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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
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** Activity 19 is a task for the portfolio. The assignment is fairly simple, but learners should complete it neatly and accurately. They must be informed in advance of how the educator will be assessing the work.

1.1 34.38
1.2 23.4
1.3 4 562
1.4 10,168
1.5 35.68

---

60 This content is available online at <http://cnx.org/content/m31210/1.1/>. 
2.60 6 LEARNER SECTION

2.60 7 Content

2.60 7.1 ACTIVITY: To use a range of techniques to perform calculations [LO 1.10.5]

1. WHO OR WHAT IS HIDDEN HERE?
   Find the answers to the clues with the help of your pocket calculator. Then colour in the spaces that contain the correct answers.

   CLUES:

<table>
<thead>
<tr>
<th>Clue</th>
<th>Calculation</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>17.98 + 16.4</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>32 - 8.6</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>4,562 x 1 000</td>
<td>.........</td>
</tr>
<tr>
<td>1.4</td>
<td>25 - 14,832</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>3,568 x 10</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>34,871 x 100</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>38.62 + 14,007</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>17.9 + 18,532</td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>432.56 ÷ 100</td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>34,981 ÷ 10</td>
<td></td>
</tr>
<tr>
<td>1.11</td>
<td>518.5 - 67,238</td>
<td></td>
</tr>
<tr>
<td>1.12</td>
<td>239.5 ÷ 1,000</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.62

Figure 2.58

2.60.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.
Assessment Standard 1.10: We know this when the learner uses a range of techniques to perform written and mental calculations with whole numbers including:
1.10.5 using a calculator.

2.61 To resolve problems in context\(^{61}\)

2.61.1 MATHEMATICS

2.61.2 Common and Decimal Fractions

2.61.3 Common Fractions

2.61.4 EDUCATOR SECTION

2.61.5 Memorandum

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LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS

- This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
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\(^{61}\)This content is available online at <http://cnx.org/content/m31213/1.1/>.
2.61.6 LEANER SECTION

2.61.7 Content

2.61.7.1 ACTIVITY: To resolve problems in context [LO 1.6.2]

2.61.7.2 To collect data and answer questions [LO 5.2]

2.61.7.3 To record data [LO 5.4]

2.61.7.4 To draw graphs [LO 5.6]

** This activity is for inclusion in your portfolio. Before you start make sure that you understand what needs to be done and how you will be assessed.

1. Look at the odometer of your parent’s car and write down the current reading.
2. Write down readings from four other motor vehicles to which you have access (family, friends, taxis, school bus, etc.)
3. Indicate this information on a graph of your own choice.
4. Determine the total distance travelled by all five of the vehicles.
5. Calculate the difference between the vehicle that has travelled the longest distance and the one that has travelled the shortest distance.
6. If your father’s car has a tank that can take 55 litres of petrol and is completely empty, what will it cost to fill the tank if the petrol for it costs R3.89 per litre?

ASSESSMENT: ODOMETERS:

1 = not at all 2 = just a little 3 = good 4 = outstanding

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completeness</td>
<td>1</td>
</tr>
<tr>
<td>Hardly any instruction has been carried out.</td>
<td></td>
</tr>
<tr>
<td>Half of the instructions have been carried out.</td>
<td></td>
</tr>
<tr>
<td>One or two instructions have not been carried out.</td>
<td></td>
</tr>
<tr>
<td>All instructions have been carried out.</td>
<td></td>
</tr>
</tbody>
</table>

| Graph | |
|-------|
| It is almost impossible to interpret. |
| The data are not organised and it is difficult to interpret. |
| The graph can be interpreted although it is not 100% correct. |
| The graph is well organised and the presentation of the data is meaningful. It is easy to interpret. |

continued on next page
Correctness of calculations | All the calculations are incorrect. | Many mistakes occur. | A few mistakes occur. | All answers are correctly calculated.

Table 2.63

2.61.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context, including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

- 1.6.2 measurements in Natural Sciences and Technology contexts;

**Learning Outcome 5:** The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

**Assessment Standard 5.2:** We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher, class and self;

**Assessment Standard 5.4:** We know this when the learner organises and records data, using tallies and tables;

**Assessment Standard 5.6:** We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped).

2.62 Test

2.62.1 MATHEMATICS

2.62.2 Common and Decimal Fractions

2.62.3 Common Fractions

2.62.4 EDUCATOR SECTION

2.62.5 Memorandum

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COMMON AND DECIMAL FRACTIONS (LO 1; 2 AND 5)

LEARNING UNIT 1 FOCUSES ON COMMON FRACTIONS

---

62This content is available online at <http://cnx.org/content/m31214/1.1/>. 
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• LEARNING UNIT 2 FOCUSES ON DECIMAL FRACTIONS
• This module extends the work that was done in grade 5. Learners should be able to do rounding of decimal fractions to the nearest tenth, hundredth and thousandth. Emphasise the use of the correct method (vertical) for addition and subtraction. Also spend sufficient time on the multiplication and division of decimal fractions.
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2.62.6 LEARNER SECTION
2.62.7 Content
2.62.7.1 TEST

1. Write the following as decimal fractions:
   1.1 \( \frac{19}{20} \) (2)
   1.2 \( \frac{3}{5} \) \hspace{1cm} (2)

2. Write the following as common fractions:
   2.1 0,782 2.2 0,57 (2)

3. Round off to one position after the decimal comma:
   3.1 4,673 3.2 21,392 (2)

4. Round off to the nearest hundredth:
   4.1 4,673 4.2 21,392 (2)

5. Round off to three positions after the decimal comma:
   5.1 4,9766 5.2 2,6755 (2)

6. Fill in: \(< ; > \) \hspace{1cm} of = :
   • \( 0,432 \frac{41}{100} \)
   • \( 3 \frac{14}{200} \) 3,015
   • \( \frac{20}{3000} \) 0,202

(3)

7. Fill in the missing answers:
   • \( 97,5 ÷ 100 = \)
   • \( 42,39 \times 1 \hspace{1cm} 000 = (4) \)
8. Calculate:

- $345.7 + 84.92 + 3.879$

(2)

- $238.21 - 78.945$

(2)

9. Cornelius caught a 3,782 kg fish. His friend, Petrus, caught a fish weighing 2,879 kg, while Carolus landed one with a mass of 645 kg. What is the combined mass of the fish that they caught?

(3)

10. Angelique’s mass is 43.28 kg. How much less is her mass than Arabella’s, whose mass is 68.59 kg?

(3)

(25)
Chapter 3

Term 3

3.1 To measure and calculate a perimeter¹

3.1.1 MATHEMATICS

3.1.2 Measurement and Time

3.1.3 Length

3.1.4 EDUCATOR SECTION

3.1.5 Memorandum

3.1.6

1. 88
2. 8,8
3. 0,88
4. 11
5. 110
6. 1,1
7. 0,11
8. 0,111
9. 1 000 m
10. 10 mm
11. 1 000 m
12. 1 000 000 mm
13. 208
14. 8
15. 39

¹This content is available online at <http://cnx.org/content/m21019/1.1/>.
3.1.7

3.1.8 Leaner Section

3.1.9 Content

3.1.10

In this module we are going to measure with the aid of various instruments.

We are going to measure:

- length,
- mass,
- circumference,
- area,
- volume,
- content,
- temperature and
- time.

3.1.11 ACTIVITY: To measure and calculate a perimeter [LO 4.4.3, LO 4.8.1]

1. An ant must walk from A to B, then to C, D, E and again to A (right around – perimeter).

1.1 What instrument will you use to calculate how far the ant walks?

1.2 Now calculate the distance the ant has walked.

1.3 In what unit did you measure?

1.4 What unit did your friend use?

2. Take a look at the following figures. Are you able to tell the educator what the "ordinary" name for each one (excepting the square) is?
2.1 These shapes are regular. Why?

2.2 Calculate the perimeter of each shape (remember the units). Write the name of each shape, followed by the answer.
   (a) _________________________________________________________________
   (b) _________________________________________________________________
   (c) _________________________________________________________________
   (d) _________________________________________________________________

2.3 If the perimeter of a square can be calculated by means of the formula \(4 \times \text{side}\), which formula would be used for each of these shapes? Write the name of the shape, followed by the answer.
   (a) _________________________________________________________________
   (b) _________________________________________________________________
   (c) _________________________________________________________________
   (d) _________________________________________________________________

2.4 What do we call the following shape?

2.5 Can you perhaps deduce a formula for calculating the perimeter of a rectangle?

REMEMBER THIS!
A square also happens to be a rectangle. It just happens to be one with four equal sides. All squares are rectangles, but all rectangles are not square.

3. Here are a few irregular shapes.
3.1 Why do we say that these shapes are irregular?

3.2 Now calculate the perimeter of each of the irregular shapes.
A: ______________________________
B: ______________________________
C: ______________________________

3.1.12 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.4: We know this when the learner estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision for:

4.4.3: length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km);

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.1: perimeter using rulers or measuring tapes.

3.2 To perform mental calculations²

3.2.1 MATHEMATICS

3.2.2 Measurement and Time

3.2.3 Length

3.2.4 EDUCATOR SECTION

3.2.5 Memorandum

1. Length of your desk = cm
   Your own height = cm / m
   Width of the class = m
   Thickness of your writing pad = mm

²This content is available online at <http://cnx.org/content/m21020/1.1/>.
Length of your pencil = cm / mm
2. km
• 1 000
• 1 000
• 100
• 10

3.2.6

3.2.7 Learner Section

3.2.8 Content

3.2.9 ACTIVITY: To perform mental calculations [LO 1.9]

Let us see how well you can remember the work that was done in the previous module. Complete this mental calculation test as quickly and as accurately as possible:

1. 11 x 8 = ___________________________
2. 11 x 0,8 = ___________________________
3. 1,1 x 0,8 = ___________________________
4. 1,1 x 10 = ___________________________
5. 1,1 x 100 = ___________________________
6. 11 ÷ 10 = ___________________________
7. 11 ÷ 100 = ___________________________
8. __________________________ x 1 000 = 111
9. 1 m = __________________________ mm
10. 1 cm = __________________________ mm
11. 1 km = __________________________ m
12. 1 km = __________________________ mm
13. 2 x 104 = __________________________
14. 0,4 x 20 = __________________________
15. Double 19,5: __________________________

3.2.10 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations involving.
3.3 To estimate, measure and record 2-dimensional shapes and 3-dimensional objects

3.3.1 MATHEMATICS

3.3.2 Measurement and Time

3.3.3 Length

3.3.4 EDUCATOR SECTION

3.3.5 Memorandum

1. Length of your desk = cm
   Your own height = cm / m
   Width of the class = m
   Thickness of your writing pad = mm
   Length of your pencil = cm / mm

2. km
   • 1 000
   • 1 000
   • 100
   • 10

3.3.6 Learner Section

3.3.7 Content

3.3.8 ACTIVITY: To estimate, measure and record 2-dimensional shapes and 3-dimensional objects [LO 4.4.3]

3.3.9 To use appropriate measuring instruments [LO 4.6.3]

From the work that was completed in Grades 4 and 5, you know that we always measure in units.

1. Take a good look at the following and then complete the table:
   • Indicate which units you will use.
   • Estimate the length.
   • Then measure the true length.

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>Estimate</th>
<th>Actual length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of your desk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your own height</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*continued on next page*

---

*This content is available online at <http://cnx.org/content/m21021/1.1/>.*
2. In what unit would you measure the distance between your home and the school?

3. Let us test your memory! See whether you are able to answer the following questions:

3.1 How many metres are there in 1 kilometre? 

3.2 How many millimetres are there in 1 metre? 

3.3 How many centimetres are there in 1 metre? 

3.4 How many millimetres are there in 1 centimetre? 

DO YOU REMEMBER THIS?
You should know it, but let us look at it again:

![Figure 3.5](image)

km m cm mm

### 3.3.10 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.5:** We know this when the learner estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision for:

- **4.4.3:** length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km);

**Assessment Standard 4.6:** We know this when the learner re uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

- **4.6.3:** rulers, metre sticks, tape measures and trundle wheels to measure length.
3.4 To solve problems involving converting between units\(^4\)

3.4.1 MATHEMATICS

3.4.2 Measurement and Time

3.4.3 Length

3.4.4 EDUCATOR SECTION

3.4.5 Memorandum

<table>
<thead>
<tr>
<th>Length in metres</th>
<th>6</th>
<th>2,001</th>
<th>0,040</th>
<th>0,338</th>
<th>24</th>
<th>16,867</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in millimetres</td>
<td>6 000</td>
<td>2 001</td>
<td>40</td>
<td>338</td>
<td>24 000</td>
<td>16 867</td>
</tr>
</tbody>
</table>

Table 3.2

<table>
<thead>
<tr>
<th>Length in metres</th>
<th>2</th>
<th>0,6</th>
<th>3,84</th>
<th>12,69</th>
<th>20,05</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in centimetres</td>
<td>200</td>
<td>60</td>
<td>384</td>
<td>1 269</td>
<td>2 005</td>
<td>900</td>
</tr>
</tbody>
</table>

Table 3.3

<table>
<thead>
<tr>
<th>Length in kilometres</th>
<th>0,500</th>
<th>13,7</th>
<th>4,618</th>
<th>2,999</th>
<th>8,006</th>
<th>22,419</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in metres</td>
<td>500</td>
<td>13 700</td>
<td>4 618</td>
<td>2 999</td>
<td>8 006</td>
<td>22 419</td>
</tr>
</tbody>
</table>

Table 3.4

3.4.6 LEANER SECTION

3.4.7 Content

3.4.7.1 ACTIVITY: To solve problems involving converting between units [LO 4.5]

3.4.7.2 To determine output values for given input values [LO 2.3.3]

1. Complete the following tables:

<table>
<thead>
<tr>
<th>Length in metres</th>
<th>6</th>
<th>2,001</th>
<th>_______</th>
<th>_______</th>
<th>24</th>
<th>_______</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in millimetres</td>
<td>_______</td>
<td>_______</td>
<td>40</td>
<td>338</td>
<td>_______</td>
<td>16 867</td>
</tr>
</tbody>
</table>

Table 3.5

\(^4\)This content is available online at <http://cnx.org/content/m21022/1.1/>.
### Table 3.6

<table>
<thead>
<tr>
<th>Length in metres</th>
<th></th>
<th></th>
<th>3,84</th>
<th>12,69</th>
<th></th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in centimetres</td>
<td>200</td>
<td>60</td>
<td></td>
<td></td>
<td>2005</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3.7

<table>
<thead>
<tr>
<th>Length in kilometres</th>
<th>0,500</th>
<th>13,7</th>
<th></th>
<th></th>
<th>8,006</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in metres</td>
<td></td>
<td></td>
<td>4,618</td>
<td>2,999</td>
<td></td>
<td>22,419</td>
</tr>
</tbody>
</table>

### 3.4.8 Assessment

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 2.3:** We know this when the learner determines output values for given input values, or input values for given input values, using:

- **2.3.3:** tables;

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.4:** We know this when the learner estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision.

### 3.5 To solve problems in context

#### 3.5.1 MATHEMATICS

#### 3.5.2 Measurement and Time

#### 3.5.3 Length

#### 3.5.4 EDUCATOR SECTION

#### 3.5.5 Memorandum

1. 1 K-S 50 km
   S-C 60 km
   C-S 70 km
   S-H 70 km
   H-R 20 km
   R-M 35 km

1.2 $\pm 275 \text{ km}$

$275 \text{ km} \div 9 \text{ km} = 30,35 = \pm 30,5 \ell$

1.3 $30,5 \times R \times 5,80 = R \times 176,90$

1.4 $1 \times 350 \div 100 = 13,5$

13,5 $\times 140 = 1890$

$= 1890 \text{ steps}$

---

*This content is available online at <http://cnx.org/content/m21026/1.1/).*
3.5.6 LEANER SECTION

3.5.7 Content

3.5.7.1 ACTIVITY: To solve problems in context [LO 1.6.1, LO 1.6.2]

3.5.7.2 To write number sentences to describe problem situations [LO 2.4]

1. You may choose a partner to work with for the next activity. Read the problems and solve them. Write neat number sentences, showing the operations clearly. Remember the units!

![Figure 3.6](image)

1.1 Study the map with scale and your ruler and determine the distances between the various towns/cities.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.2 What is the total distance (as measured by you) between Cape Town and Mossel Bay?

If the fuel consumption of a car is 9 km/ℓ, how many litres of fuel are needed for the trip?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.3 Now use these answers and calculate what the fuel for the journey will cost if fuel currently costs R5.80 per litre.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.4 A girl has to take 140 steps to cover a distance of 100 m. She lives 1,350 km from the school. How many steps will she have to take to cover the distance?
1.5 Explain to the rest of the class how the two of you calculated the answers.

1.6 Compare your methods with those of the rest of the class. How do they differ and how are they similar?

Assess your work on a scale of 1 – 4 by circling the appropriate number:

1 = not at all
2 = not very well
3 = well
4 = excellently

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>My partner and I worked together.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>We listened to one another.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>We answered all the questions.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>We worked neatly.</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Our answers were correct.</td>
<td>1 2 3 4</td>
</tr>
</tbody>
</table>

Table 3.8

3.5.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.1: financial;
1.6.2: measurements in Natural Sciences and Technology contexts;

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 2.4:** We know this when the learner writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.

3.6 To solve problems in context

3.6.1 MATHEMATICS

3.6.2 Measurement and Time

3.6.3 Length

3.6.4 EDUCATOR SECTION

3.6.5 Memorandum

1. Susan = 3,48
   Lala = 3,4
   Lauren = 3,2
   Anna = 3,12

2. Susan: \((2,32 + 3,48 + 3,02 + 2,9) ÷ 4 = 2,93\) (2,9 m)  
   Lala: \((3,2 + 3,04 + 2,86 + 3,4) ÷ 4 = 3,125\) (3,1 m)  
   Lauren: \((2,88 + 2,96 + 3,06 + 3,2) ÷ 4 = 3,025\) (3 m)  
   Anna: \((3,02 + 2,94 + 2,84 + 3,12) ÷ 4 = 2,98\) (3 m)

3. \((12,95 \text{ km} + 14,73 \text{ km} + 8,94 \text{ km} + 13,8 \text{ km} + 6,86 \text{ km}) ÷ 5\)  
   = 11,456 km (11,5 km)

4. 11,5 km

3.6.6 LEARNER SECTION

3.6.7 Content

3.6.8

3.6.9 ACTIVITY: To solve problems in context [LO 1.6.2]

It is important to be able to calculate averages, because it is something that is commonly used in everyday life. You have heard of average rainfall per month, the average temperature of the place where you live during a particular season, your class average, etc.

1. Take a good look at the following and then write down what the distance of the best jump of each athlete is:

   At an athletics meeting four athletes participated in the u.13 long jump for girls.

   Each completed four jumps.

---

6This content is available online at <http://cnx.org/content/m21028/1.1/>. 
<table>
<thead>
<tr>
<th>Name</th>
<th>Jump 1</th>
<th>Jump 2</th>
<th>Jump 3</th>
<th>Jump 4</th>
<th>Best Jump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susan</td>
<td>2,32</td>
<td>3,48</td>
<td>3,02</td>
<td>2,9</td>
<td>_________</td>
</tr>
<tr>
<td>Lala</td>
<td>3,2</td>
<td>3,04</td>
<td>2,86</td>
<td>3,4</td>
<td>_________</td>
</tr>
<tr>
<td>Lauren</td>
<td>2,88</td>
<td>2,96</td>
<td>3,06</td>
<td>3,2</td>
<td>_________</td>
</tr>
<tr>
<td>Anna</td>
<td>3,02</td>
<td>2,94</td>
<td>2,84</td>
<td>3,12</td>
<td>_________</td>
</tr>
</tbody>
</table>

Table 3.9

- By looking at each girl’s best jump, we can determine who won.
- However, this does not tell us who fared the best in general (over all the jumps).
- To determine this we have to look at the average of each girl’s jumps.
- The following is the formula for calculating the average:

\[
\text{Average distance} = \frac{\text{total of all the jumps}}{\text{number of jumps}}
\]

**Figure 3.7**

In Susan’s case it will be calculated as follows:

\[
= \frac{2,32 \text{ m} + 3,48 \text{ m} + 3,02 \text{ m} + 2,9 \text{ m}}{4}
\]

**Figure 3.8**

\[
= 2,93 \text{ m (rounded off to the first decimal: 2,9 m)}
\]

2. Now use this formula to determine, according to the averages for the four athletes, who generally fared the best in the long jump for u.13 girls (rounded off to the first decimal).

3. Calculate the average distance that Johan runs per day if he ran the following distances from Monday to Friday:
   Mon. 12,95 km; Tue. 14,73 km; Wed. 8,94 km; Thu. 13,8 km; Fri. 6,86 km.
4. Round off your answer to the first decimal place.

### 3.6.9.1 TIME FOR SELF-ASSESSMENT

We examined particular aspects of measuring in Learning Unit 1. Before starting to work through Learning Unit 2, we have to find out whether there are any hitches, i.e. whether there is anything that you do not understand properly. Show us how you feel about the completed work by neatly colouring the blocks that represent your feelings about the work:

**CRITERIA**

<table>
<thead>
<tr>
<th>I know the meaning of perimeter.</th>
<th>Not at all</th>
<th>Fairly well</th>
<th>Well</th>
<th>Really well</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know the formula for determining the perimeter of a square. (LO 4.8)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>I am able to determine the perimeters of the following figures:</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>Square (LO 4.8)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>Pentagon (LO 4.8)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>Hexagon (LO 4.8)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>Octagon (LO 4.8)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>I am able to determine the perimeter of an irregular figure. (LO 4.8)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
</tbody>
</table>

*continued on next page*
<table>
<thead>
<tr>
<th>I am able to convert metres to millimetres and vice versa. (LO 4.8)</th>
<th>Not at all</th>
<th>Fairly well</th>
<th>Well</th>
<th>Really well</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am able to convert metres to centimetres and vice versa. (LO 4.8)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>I am able to convert kilometres to metres and vice versa. (LO 4.5)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>I am able to determine distances according to scale. (LO 1.6)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
<tr>
<td>I am able to calculate average distance. (LO 1.6)</td>
<td>Not at all</td>
<td>Fairly well</td>
<td>Well</td>
<td>Really well</td>
</tr>
</tbody>
</table>

Table 3.10

3.6.10 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.6: We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2: measurements in Natural Sciences and Technology contexts.

3.7 To investigate how to determine area

3.7.1 MATHEMATICS

3.7.2 Measurement and Time

3.7.3 Area

3.7.4 EDUCATOR SECTION

3.7.5 Memorandum

3.7.6

1.1 \(5 \times 7 = 35\)

1.2 \(1 \times b = \text{opp.}\)

---

This content is available online at [http://cnx.org/content/m21029/1.1/](http://cnx.org/content/m21029/1.1/).
3.7.7 LEANER SECTION

3.7.8 CONTENT

3.7.9

Have you ever had new tiles or carpets laid in your house? What do you have to know about a room to be able to have something like this done?

3.7.10 ACTIVITY: To investigate how to determine area [LO 4.8.2]

1. This is the floor plan of the Vissers’ kitchen. Mrs Visser wants to lay new tiles. The tiles are each 1 m wide and 1 m long.

![Figure 3.9](image)

Figure 3.9

1.1 How many tiles do you need to cover the floor?

1.2 How did you calculate this? Can you explain this in one or two clear number sentences?

REMEMBER:
You multiply the length of the one side with the length of the other one.
The unit is then expressed to the power of 2 (m²).

![Figure 3.10](image)

Figure 3.10

You have just calculated the area of Mrs Visser’s kitchen floor.

1.3 Can you perhaps write down a formula for calculating the area of such a regular shape?

Area of a rectangle: ____________________________
3.7.11 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.8:** We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.

3.8 To calculate area*

3.8.1 MATHEMATICS
3.8.2 Measurement and Time
3.8.3 Area
3.8.4 EDUCATOR SECTION
3.8.5 Memorandum

1. A: ± 20 squares = 20 × 25 mm²
   B: ± 10 squares = 10 × 25 mm²

3.8.6 LEANER SECTION

3.8.7 Content

3.8.8 ACTIVITY: To calculate area [LO 4.8.2]

1. Now determine the area of the following objects by using the “square sheet” method (each square is 5 mm by 5 mm).

---

*This content is available online at <http://cnx.org/content/m21032/1.1/>.
3.8.8.1

3.8.8.2 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.
3.9 To calculate area by investigating and estimating\(^9\)

3.9.1 MATHEMATICS

3.9.2 Measurement and Time

3.9.3 Area

3.9.4 EDUCATOR SECTION

3.9.5 Memorandum

3.9.6

1.1 $13 \text{ cm} \times 13 \text{ cm} = 169 \text{ cm}^2$
1.2 $2.2 \text{ m} \times 1.4 \text{ m} = 3.08 \text{ m}^2$
1.3 $181 \text{ m} \times 93 \text{ m} = 16833 \text{ m}^2$
1.4 $4.2 \text{ m} \times 2.8 \text{ m} = 11.76 \text{ m}^2$
1.5 $243 \text{ mm} \times 178 \text{ mm} = 43254 \text{ mm}^2$

3.9.7 LEARNER SECTION

3.9.8 Content

3.9.9

3.9.10 ACTIVITY: To calculate area by investigating and estimating [LO 4.8.2]

1. Let us see whether you are able to calculate the area of the following (remember to begin your operations with a number sentence and also to take care to include the unit when you write down your final answer):

1.1 the area of a square with a side length of 13 cm

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.2 the top of a desk of 2.2 m by 1.4 m

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.3 an elongated rugby field that is 181 m long and 93 m wide

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.4 how much carpeting you need to cover the floor of a room that is 4.2 m by 2.8 m

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.5 the cover of a Mathematics book with a length of 243 mm and a width of 178 mm.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

\(^9\)This content is available online at <http://cnx.org/content/m21034/1.1/>.
3.9.11 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.8: We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.

3.10 To solve problems in context\(^{10}\)

3.10.1 MATHEMATICS

3.10.2 Measurement and Time

3.10.3 Area

3.10.4 EDUCATOR SECTION

3.10.5 Memorandum

1.1 \[22 \text{ m} + 11 \text{ m} + 33 \text{ m} + 40 \text{ m} + 28 \text{ m} + 68 \text{ m} = 202 \text{ m}\]
1.2 202 poles
2. \[112 \text{ m} \times 75 \text{ m} = 8400 \text{ m}^2\]
Cost: \[8400 \times R1,20 = R10 080\]
3. \[45 \text{ m} \times 45 \text{ m} = 2025 \text{ m}^2\]
\[R56 679,75 \div 2025 = R27,99/\text{m}^2\]
4. \[225 \text{ cm} \times 75 \text{ cm} = 16875 \text{ cm}^2\]
\[2,25 \text{ m} \times 0,75 \text{ m} = 16875 \text{ m}^2\]
5. \[50,32 \text{ m}^2 \div 7,4 \text{ m} = 6,8 \text{ m}\]

3.10.6 LEANER SECTION

3.10.7 Content

3.10.7.1 Activity: To solve problems in context [LO 1.6.2]

3.10.7.2 To calculate area by investigating and estimating [LO 4.8.2]

You have to divide into groups of three for this activity. You may use pocket calculators for solving the problems. Work neatly and show clearly how you go about to find the answers. Enjoy puzzling it out!

1. A farmer has to fence a paddock containing calves.

\(^{10}\)This content is available online at <http://cnx.org/content/m21041/1.1/>. 
1.1 Calculate how much wire is needed to fence the paddock.

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

1.2 If the poles for the fence are planted 1 m apart, how many poles are required?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

2. Grass seed has to be sown on the new hockey field. The field is 112 m by 75 m. If the seed costs R1,20 per m², what will the cost for the whole project be?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

3. If a square playing field with a length of 45 m is tarred, the total cost is R56 679,75. What is the cost of the tar per 1 m²?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

4. A portion of a bathroom wall of 2,25 m by 0,75 m must be covered by new tiles. The tiles are square, with a length of 15 cm. How many tiles are required?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

5. A classroom has an area of 50,32 m². If the length is 7,4 m, what is the width?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

Figure 3.12
ASSESSMENT: PROBLEM SOLVING

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neatness and organisation</td>
<td>The work is untidy and is disorganised.</td>
</tr>
<tr>
<td>Logical reasoning</td>
<td>There is very little evidence of logical reasoning</td>
</tr>
<tr>
<td>Correctness of calculations</td>
<td>All the answers are calculated incorrectly</td>
</tr>
</tbody>
</table>

Table 3.11

3.10.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

1.6.2: measurements in Natural Sciences and Technology contexts;

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.8:** We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.2: area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles.
3.11 To estimate, measure and record the mass of 2-dimensional shapes and to use appropriate measuring instruments\textsuperscript{11}

3.11.1 MATHEMATICS

3.11.2 Measurement and Time

3.11.3 Length

3.11.4 EDUCATOR SECTION

3.11.5 Memorandum

3.11.6 LEARNER SECTION

3.11.7 Content

3.11.7.1 ACTIVITY: To estimate, measure and record the mass of 2-dimensional shapes and to use appropriate measuring instruments [LO 4.6.1]

3.11.7.2 To use appropriate measuring instruments [LO 4.6.1]

1. Have you ever paused to think about how many things we pick up and carry around with us every day? You can say whether something is heavy or light, but have you ever wondered what the mass of a particular article is, that you are carrying? Let us look at a couple of examples. Complete the following table. First estimate and then determine the exact mass. Use a kitchen scale!

<table>
<thead>
<tr>
<th>Item</th>
<th>Estimated</th>
<th>Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 tin of cool drink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 hairbrush</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 pencil box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 Mathematics book</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.12

3.11.8 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.6:** We know this when the learner uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

- **4.6.1**: bathroom scales, kitchen scales and balances to measure mass.

\textsuperscript{11}This content is available online at \texttt{http://cnx.org/content/m21111/1.1/}. 

3.12 To calculate by selecting appropriate operations for solving particular problems

3.12.1 MATHEMATICS

3.12.2 Measurement and Time

3.12.3 Area

3.12.4 EDUCATOR SECTION

3.12.5 Memorandum

1.1 2,915.95 kg
1.2 1,998 kg
1.3 0.750 kg
1.4 26,082 kg
2.1 3,098 kg
2.2 4,104 kg
2.3 1,219 kg
2.4 18,797 kg
3.1 48,688 kg
3.2 15,272 kg
3.3 8,722 kg
3.4 238.117 g
3.5 0.320 kg
3.6 127.296 g

3.12.6 LEARNER SECTION

3.12.7 Content

3.12.7.1 ACTIVITY: To calculate by selecting appropriate operations for solving particular problems [LO 4.5]

Let's first see how well you are able to add and subtract without the help of a pocket calculator.

1. Reduce the following masses by 50 g:
   1.1 2,916 kg = ________________________________ kg
   1.2 2,048 kg = ________________________________ kg
   1.3 0.800 kg = ________________________________ kg
   1.4 26,132 kg = _______________________________ kg
2. Increase the following masses by 300 g:
   2.1 2,798 kg = ________________________________ kg
   2.2 3,804 kg = ________________________________ kg
   2.3 0.919 kg = ________________________________ kg
   2.4 18,497 kg = ________________________________ kg
3. Complete the calculations without the use of a calculator (first make units the same):
   3.1 38,942 kg + 9,746 kg =
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________

12This content is available online at <http://cnx.org/content/m21079/1.1/>. 
3.2 $6913 \text{ kg} + 8,359 \text{ t} =$

$=$

3.3 $9 \text{ t} - 278 \text{ kg} =$

$=$

3.4 $18,517 \text{ g} + 219,6 \text{ g} =$

$=$

3.5 $8 \text{ kg} \div 25 =$

$=$

3.6 $15,912 \text{ g} \times 8 =$

$=$

3.12.8 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.5:** We know this when the solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating with appropriate Technology and Natural Sciences contexts.
3.13 To use appropriate measuring instruments\textsuperscript{13}

3.13.1 MATHEMATICS

3.13.2 Measurement and Time

3.13.3 Area

3.13.4 EDUCATOR SECTION

3.13.5 Memorandum

A. 0,05 kg (50 g)
B. 0,35 kg (350 g)
C. 0,55 kg (550 g)
D. 0,9 kg (900 g)
E. 0,2 kg (200 g)
F. 0,7 kg (700 g)
G. 1,4 kg
H. 1,9 kg

3.13.6 LEANER SECTION

3.13.7 Content

3.13.7.1 ACTIVITY: To use appropriate measuring instruments [LO 4.6.1]

1. You should be able to read and interpret scales quite easily by now. Read the masses indicated on the following mass meters and write them down neatly.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure3.13}
\caption{Figure 3.13}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure3.14}
\caption{Figure 3.14}
\end{figure}

\textsuperscript{13}This content is available online at \texttt{<http://cnx.org/content/m21080/1.1/>}. 
3.13.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.6: We know this when the learner uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

4.6.1: bathroom scales, kitchen scales and balances to measure mass.

3.14 To calculate by selecting appropriate operations for solving particular problems

3.14.1 MATHEMATICS

3.14.2 Measurement and Time

3.14.3 Area

3.14.4 EDUCATOR SECTION

3.14.5 Memorandum

1. 14 856 kg − (235 + 39 kg) = 5 691 kg

2. (10 000 kg − 9 165 kg) ÷ 39 = 21.41
   = 21 bags

3.14.6 LEARNER SECTION

3.14.7 Content

3.14.7.1 ACTIVITY: To calculate by selecting appropriate operations for solving particular problems [LO 1.8.2, LO 1.8.4]

3.14.7.2 To write number sentences to describe a problem situation [LO 2.4]

Do this work on your own. Read through the problems provided below and see whether you are able to find the solutions. Remember to use the number sentences! Also remember to show neat, clear operations and don’t forget about the units.

1. A truck transports 235 bags of sand weighing 39 kg each. If the truck with its load weighs 14 856 kg, what is the mass of the truck without its load?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

14This content is available online at <http://cnx.org/content/m21081/1.1/>. 
2. It is a 10 ton truck (may transport a maximum of 10 tons). How many bags can still be loaded without exceeding the mass limit?

---

3.14.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.8:** We know this when the learner estimates and calculates by selecting and using operations appropriate to solving problems that involve:

1.8.2: addition and subtraction of whole numbers;
1.8.4: multiplication of at least whole 4-digit by 3-digit numbers;

**Learning Outcome 2:** The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

**Assessment Standard 2.4:** We know this when the learner writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.

3.15 Performing mental calculations

3.15.1 MATHEMATICS

3.15.2 Measurement and Time

3.15.3 Area

3.15.4 EDUCATOR SECTION

3.15.5 Memorandum

1. 0,2
2. 0,32
3. 2,17
4. 99,8
5. 5 980
6. 1,984
7. 39,6
8. 9,75
9. 4 700 mm
10. 10,5 ℓ
11. 6 m
12. 7,2 ℓ
13. 1,75 kg
14. 2 918 m ℓ
15. 0,017 km

---

\(^{15}\)This content is available online at <http://cnx.org/content/m21082/1.1/>. 
3.15.6 LEARNER SECTION

3.15.7 Content

3.15.7.1 ACTIVITY: Performing mental calculations [LO 1.9]

It is time to see if you can improve your skill in mental calculation! Apply the knowledge that you have already gained and note how quickly and accurately you are able to complete this mental calculation test.

1. \[200 \div 1000 = \] 
2. \[32 \div 100 = \] 
3. \[217 \div 100 = \] 
4. \[5.98 \times 10 = \] 
5. \[59.8 \times 100 = \] 
6. \[198.4 \div 100 = \] 
7. Double 19.8: \[\] 
8. Halve 19.5: \[\] 
9. \[5 \text{ m} - 300 \text{ mm} = \] 
10. \[12 \ell - 1.5 \ell = \] 
11. \[3.8 \text{ m} + 2.2 \text{ m} = \] 
12. \[2.4 \ell \times 3 = \] 
13. \[\text{of} 3.5 \text{ kg} = \] 
14. \[2.918 \ell = \] 
\[\text{m}\ell\] 
15. \[17 \text{ m} = \] 
\[\text{km}\]

3.15.8 Assessment

Learning Outcome 1: The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standard 1.9: We know this when the learner performs mental calculations.

3.16 To multiply with decimals\(^{16}\)

3.16.1 MATHEMATICS

3.16.2 Measurement and Time

3.16.3 Area

3.16.4 EDUCATOR SECTION

3.16.5 Memorandum

1.

1.1 5,76
1.2 12 302,4
1.3 70,08
1.4 2,32
1.5 1 412,64
1.6 105,86

\(^{16}\)This content is available online at <http://cnx.org/content/m21083/1.1/>. 
3.16.6 LEANER SECTION

3.16.7 Content

3.16.7.1 ACTIVITY: To multiply with decimals

1. As you might have realised, working with decimal fractions forms an important part of this module. How good is your memory of what we have done in the previous module? Apply your memory and calculate the following without using a pocket calculator.

1.1 \(3,2 \times 1,8 = \)

2.5 \(126 \times 2,4 = \)

3.2 \(21,9 \times 3,2 = \)

4.1 \(1,86 \times 1,2 = \)

5. \(32,4 \times 43,6 = \)

6. \(13,4 \text{ m} \times 7,9 \text{ m} = \)

7. \(285,72 \div 1,2 = \)
3.17 To solve problems that include converting between S.I. units

3.17.1 MATHEMATICS

3.17.2 Measurement and Time

3.17.3 Content

3.17.4 EDUCATOR SECTION

3.17.5 Memorandum

1.1 3 000
1.2 0,003
1.3 30
1.4 147
1.5 1 200
1.6 29 804
1.7 1 507
1.8 300 000
1.9 19
1.10 250

3.17.6 LEARNER SECTION

3.17.7 Content

Do you know the answers of the following? _________________________________

- How much cool drink is there in a standard tin? __________________________
- How much milk is there in the sachets at the supermarket?________________
- How much water can your geyser hold? _________________________________
- How much yoghurt is there in the small containers? ______________________

You have just given the capacity of the cool drink tin, milk sachet, geyser and yoghurt container.

The units for capacity are:

17This content is available online at <http://cnx.org/content/m21084/1.1/>. 
3.17.7.1 ACTIVITY: To solve problems that include converting between S.I. units [LO 4.5]

1. This activity should be like child’s play! Let us see how well you can remember the work. Take a good look at the following and convert as required:

1.1 $3 \ell = \text{__________________________ m} \ell$
1.2 $2 \ell = \text{__________________________ k} \ell$
1.3 $0,03 \ell = \text{__________________________ m} \ell$
1.4 $0,147 \text{ k} \ell = \text{__________________________ } \ell$
1.5 $1,2 \text{ k} \ell = \text{__________________________ } \ell$
1.6 $29,804 \ell = \text{__________________________ m} \ell$
1.7 $1,507 \text{ k} \ell = \text{__________________________ } \ell$
1.8 $300 \ell = \text{__________________________ m} \ell$
1.9 $19 \text{ 000 m} \ell = \text{__________________________ } \ell$
1.10 $1 \text{ cup} = \text{__________________________ m} \ell$

3.17.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.5: We know this when the solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating with appropriate Technology and Natural Sciences contexts.

3.18 To perform mental calculations

3.18.1 MATHEMATICS

3.18.2 Measurement and Time

3.18.3 Content

3.18.4 EDUCATOR SECTION

3.18.5 Memorandum

1. 360
2. 0,36
3. 3
4. 0,036
5. 5,88

18This content is available online at <http://cnx.org/content/m21086/1.1/>.
6. 6
7. 6,6
8. 20
9. =
10. =
11. =
12. =
13. =
14. =
15. >
1 \ell = 4 \text{ cups}
1 \text{ teaspoon} = 5 \text{ ml}
1 \text{ cup} = 50 \text{ teaspoons}
1 \text{ medicine measure} = 5/10 \text{ ml}

### 3.18.6 LEARNER SECTION

#### 3.18.7 Content

#### 3.18.7.1 ACTIVITY: To perform mental calculations [LO 1.9]

This is another opportunity to hone your mental calculation skills. Complete the following as quickly and accurately as possible.

1. \(3.6 \times 100 = \) ______________________
2. \(3.6 \div 10 = \) ______________________
3. \(0.03 \times 100 = \) ______________________
4. \(0.36 \div 10 = \) ______________________
5. \(3.42 + 2.46 = \) ______________________
6. \(3.75 + 2.25 = \) ______________________
7. \(10 - \) ______________________ = 3.4
8. \(10 \div 0.5 = \) ______________________

Fill in: =; >; <

9. 3.4 km __________ 111 __________ 3 040 m
10. 10 m __________ 111 __________ 63 cm
11. 0.46 kg __________ 111 __________ 460 g
12. 0.003 \ell __________ 111 __________ 3 ml
13. 13 km __________ 111 __________ 320 m
14. 0.75 m __________ 111 __________ m
15. 2 \ell __________ 111 __________ 2,5 \ell

Can you perhaps help?!

How many cups are there in 1 \ell? ______________________________________

- How many ml in one teaspoon? ________________________________
- How many teaspoons in one cup? ________________________________
- How many ml in one medicine measure? __________________________

#### 3.18.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations.
3.19 To use appropriate measuring instruments\(^{19}\)

3.19.1 MATHEMATICS

3.19.2 Measurement and Time

3.19.3 Content

3.19.4 EDUCATOR SECTION

3.19.5 Memorandum

2. 2.1 A 0,05
   B 0,2
   C 0,4
   D 0,35
   2.2 E 1
   F
   3.
   A 0,3 \(\ell\)
   B 0,7 \(\ell\)
   C 1,2 \(\ell\)
   D 1,8 \(\ell\)
   E 0,2 \(\ell\)
   F 0,8 \(\ell\)
   G 1,4 \(\ell\)
   H 1,4 \(\ell\)
   I 0,15 \(\ell\)
   J 0,45 \(\ell\)
   K 0,75 \(\ell\)
   L 1,2 \(\ell\)
   M 0,25 \(\ell\)
   N 0,625 \(\ell\)
   O 1,75 \(\ell\)
   P 2,375 \(\ell\)

1.
   1.1 11,7218 \(\ell\)
   1.2 16,73 \(\ell\)
   1.3 107,15 \text{ m}\(\ell\)
   1.4 4 123 k\(\ell\)
   1.5 102,76 m
   1.6 123 k\(\ell\)

3.19.6 LEANER SECTION

3.19.7 Content

3.19.7.1 ACTIVITY: To use appropriate measuring instruments [LO 4.6.2]

1. Let’s talk about measuring jugs!
   1.1 For what reason might your mother or father use a measuring jug at home?

\(^{19}\)This content is available online at \(\text{<http://cnx.org/content/m21087/1.1/>}\).
1.2 What are the units in which a measuring jug is marked?

1.3 Do measuring jugs come in different sizes? If so, what are the sizes?

2. Study the following measuring jugs and take down the readings.

2.1 Express the measurements for A, B, C and D in litres (ℓ):
A ________________________ ℓ  
B ________________________ ℓ  
C ________________________ ℓ  
D ________________________ ℓ

2.2 Express the measurements at E and F in cups:
E ________________________ cups  
F ________________________ cups

3. Study the measuring jars and take the readings.
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________________</td>
<td>____________________</td>
<td>____________________</td>
<td>____________________</td>
</tr>
</tbody>
</table>

Figure 3.18

<table>
<thead>
<tr>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________________</td>
<td>____________________</td>
<td>____________________</td>
<td>____________________</td>
</tr>
</tbody>
</table>

Figure 3.19

<table>
<thead>
<tr>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________________</td>
<td>____________________</td>
<td>____________________</td>
<td>____________________</td>
</tr>
</tbody>
</table>
3.19.8 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.6:** We know this when the learner uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:

- 4.6.2: measuring jugs to measure capacity.

3.20 To calculate by using S.I.(Systéme Internationale) units

3.20.1 MATHEMATICS

3.20.2 Measurement and Time

3.20.3 Content

3.20.4 EDUCATOR SECTION

3.20.5 Memorandum

1. 
   1.1 643 km ÷ 50 = 12.86 km
   1.2 2 575 ℓ ÷ 125 ℓ = 20.6 = 20 full drums
   1.3 37,5 mℓ × 275 = 10 312,5 mℓ = 10,3125 ℓ
   1.4 538 900 ℓ - 98 476 ℓ = 440 424 ℓ = 440,424 kℓ
   1.5 900 mℓ + 300 mℓ + 480 mℓ + 1 140 mℓ
   1.6 = 2 820 mℓ = 2,820 ℓ

---

20This content is available online at <http://cnx.org/content/m21090/1.1/>. 
3.20.6 LEANER SECTION

3.20.7 Content

3.20.7.1 ACTIVITY: To calculate by using S.I. (Système Internationale) units [LO 4.5]

1. Calculate the following without the use of a pocket calculator. Work neatly and show all operations. Do not forget to indicate the unit.

   1.1 \( 1,247 \ell \times 9,4 = \)

   1.2 \( 836,50 \ell \div 50 = \)

   1.3 \( 2,143 \text{ m} \ell \times 50 = \)

   1.4 \( 1,236,90 \text{ k} \ell \div 0,3 = \)

   1.5 \( 2,569 \text{ m} \times 40 = \) ...............

   1.6 \( 36,90 \text{ k} \ell \div 0,3 = \)
3.20.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 4.5: We know this when the learner solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating with appropriate Technology and Natural Sciences contexts.

3.21 To investigate and approximate

3.21.1 MATHEMATICS
3.21.2 Measurement and Time
3.21.3 Length
3.21.4 EDUCATOR SECTION
3.21.5 Memorandum
3.21.6 LEARNER SECTION
3.21.7 Content

3.21.7.1 ACTIVITY: To solve problems in context [LO 1.6.2]

1. Your educator will provide the required paper. Examine the diagram below and copy it exactly. Try to construct your own cube from this.

![Figure 3.21]

---

21) This content is available online at <http://cnx.org/content/m21109/1.1/>.
You now have a container with the following measurements:

1 cm by 1 cm by 1 cm

We therefore say that the volume of the container is:

\[1 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm} = 1 \text{ cm}^3\]

(one cubic centimetre)

volume = length \times width \times height

2. How many of these boxes (of 1 cm³) will you need to build a cube of 8 cm³? (2 cm \times 2 \text{ cm} \times 2 \text{ cm})

\[
\begin{align*}
2.1 & \quad 8 \text{ cm}^3 = (2 \times 2 \times 2 \text{ cm}): \underline{2} \quad \text{cubes} \\
2.2 & \quad 27 \text{ cm}^3 = (3 \times 3 \times 3 \text{ cm}): \underline{3} \quad \text{cubes} \\
2.3 & \quad 64 \text{ cm}^3 = (4 \times 4 \times 4 \text{ cm}): \underline{4} \quad \text{cubes} \\
2.4 & \quad 125 \text{ cm}^3 = (5 \times 5 \times 5 \text{ cm}): \underline{5} \quad \text{cubes}
\end{align*}
\]

3.21.8 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.8:** We know this when the learner investigates and approximates (alone and/or as a member of a group or team):

4.8.3: volume/capacity of objects (by packing or filling them) in order to develop rules for calculating volume of rectangular prisms.
3.22 To solve problems in context

3.22.1 MATHEMATICS

3.22.2 Measurement and Time

3.22.3 Volume

3.22.4 EDUCATOR SECTION

3.22.5 Memorandum

1. 1.3 cm × 2 cm × 2 cm = 12 cm³
   3 cm × 2 cm × 3 cm = 18 cm³
   1 cm × 4 cm × 3 cm = 12 cm³
   1.2 5 m × 3.5 m × 2 m = 35 m²
   1.3 9 cm × 6 cm × 2 cm = 108 cm²
   2. 2.1 577 912 cm²
   2.1 583 296 cm²
   3. (78 cm × 46 cm × 52 cm) ÷ (24 cm × 8 cm × 11 cm)
      = 186 576 cm² ÷ 2 112 cm²
      = 88,34
      = 88 small boxes

3.22.6 LEARNER SECTION

3.22.7 Content

3.22.7.1 ACTIVITY: To solve problems in context [LO 1.6.2]

1. Calculate the volume of the following:

   1.1

   Figure 3.24

   Figure 3.25

---

22This content is available online at &lt;http://cnx.org/content/m21091/1.1/&gt;.
1.2 A swimming pool 5 m long, 3.5 m wide and 2 m deep.

1.3 A tin of tuna: 9 cm by 6 cm by 2 cm.

2. Which container has the biggest volume:
   2.1: 106 cm by 94 cm by 58 cm, or
   2.2: 93 cm by 98 cm by 64 cm?

3. How many small boxes with the measurements 24 cm × 8 cm × 11 cm can you pack into a big box of 78 cm by 46 cm by 52 cm?

3.22.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.6:** We know this when the learner solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:

- 1.6.2: measurements in Natural Sciences and Technology contexts.
3.23 To perform mental calculations

3.23.1 MATHEMATICS

3.23.2 Measurement and Time

3.23.3 Volume

3.23.4 EDUCATOR SECTION

3.23.5 Memorandum

1. 100
2. 10 000
3. 4
4. 8
5. 27
6. 125
7. 9
8. 4
9. 2
10. 20
11. 9
12. 3
13. 7
14. 100 + 100 000 = 100 100
15. 22

3.23.6 LEARNER SECTION

3.23.7 Content

3.23.7.1 ACTIVITY: To perform mental calculations [LO 1.9]

By this time you should be quite bright and quick when working with numbers. Let’s see how you perform in the next mental calculation test! Try to complete it within three minutes:

1. 102 = ______________________
2. 104 = ______________________
3. 22 = ______________________
4. 23 = ______________________
5. 33 = ______________________
6. 33 = ______________________
7. ______________________2 = 81
8. ______________________3 = 64
9. 3 × 5 × ______________________ = 30
10. 0.3 × 5 × ______________________ = 30
11. 3 × ______________________ = 27
12. 3 ______________________ = 27
13. 102 × 105 = 10 ______________________
14. 102 + 105 = ______________________
15. 29 × 22 = (30 × 22) - ______________________

23This content is available online at http://cnx.org/content/m21094/1.1/.
3.23.8 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations.

3.24 To read analogue time and write 24-hour time

3.24.1 MATHEMATICS

3.24.2 Measurement and Time

3.24.3 Time

3.24.4 EDUCATOR SECTION

3.24.5 Memorandum

1.
1.1 07.30
1.2 21.15
1.3 05.50
1.4 22.40
1.5 19.00

3.24.6 LEARNER SECTION

3.24.7 Content

- At what time did you go to bed last night?

---

Figure 3.27

Half past eight?

---

24This content is available online at <http://cnx.org/content/m21097/1.1/>. 
Eight thirty?

Twenty thirty?
Do you still remember?
60 s (seconds) = 1 min (minute)
60 min = 1 h (hour)
24 h = 1 d (day)
7 d = 1 wk (week)
365 d = 1 a (year)
366 d = 1 leap year
52 wks (approximately) = 1 a
12 months = 1 a
100 a = 1 century

3.24.7.1 ACTIVITY: To read analogue time and write 24-hour time [LO 4.1]

1. In Grades 4 and 5 you did quite a lot of work involving time. Let’s see whether you are able to apply your knowledge. Write the following according to the international system of writing.
   1.1 half past seven (a.m.) è _______:_______
   1.2 quarter past nine (p.m.) _______:_______
   1.3 ten to six (a.m.) _______:_______
   1.4 twenty to eleven (p.m.) _______:_______
   1.5 seven o’clock (p.m.) è _______:_______

3.24.8 Assessment

Learning Outcome 4: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.
CHAPTER 3. TERM 3

Assessment Standard 4.1: We know this when the reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second.

3.25 To solve problems involving operations and conversion of time units

3.25.1 MATHEMATICS

3.25.2 Measurement and Time

3.25.3 Time

3.25.4 EDUCATOR SECTION

3.25.5 Memorandum

1.1 2 h 16 min = 18 h 8 min
  2 h 16 min + 15 h 52 min = 17 h 68 min
  1 h 15 h - 8 h 27 min = 6 h 33 min
  15 h 00 min - 8 h 27 min = 6 h 33 min
  1.3 8 h 6 min - 2 h 45 min = 5 h 21 min
  8 h 06 min - 2 h 45 min = 5 h 21 min
  1.4 12 × 3 h 48 min = 45 h 36 min
  12 × 3 h 48 min = 36 h 576 min
  1.5 4 h 30 min ÷ 15 min = 18
  200 min ÷ 15 min
  2.1 16 h 10 min - 10 h 00 min = 6 h 10 min
  6 h 10 min - 50 min = 5 h 20 min
  a) 1 h 30 min
  b) 35 min
  c) 6 h 5 min
  d) 4 h

3.25.6 LEARNER SECTION

3.25.7 Content

3.25.7.1 ACTIVITY: To solve problems involving operations and conversion of time units [LO 4.2]

We are also going to check whether you still remember how to add and subtract when working with time.

1. Calculate the following:

1.1 2 h 16 min + 15 h 52 min = ____________ h ____________ min
   ____________________________________________________________
   ____________________________________________________________

1.2 15 h - 8 h 27 min = ____________ h ____________ min
   ____________________________________________________________
   ____________________________________________________________

1.3 8 h 6 min - 2 h 45 min = ____________ h ____________ min

25 This content is available online at <http://cnx.org/content/m21098/1.1/>. 
1.4 $12 \times 3 \text{ h 48 min} = \underline{\text{h}} \underline{\text{min}}$

1.5 $4 \text{ h 30 min} \div 15 \text{ min} = \underline{\underline{\text{}}}$

2. Write clear number sentences to solve the following problems:
2.1 A cricket match started at 10:00 and stopped at 16:10. How much time was spent on the game if there were two rest periods of 10 minutes each and a lunch period of 30 minutes?

2.2 The following is Gerda’s class timetable for Mondays.
a) How much time is spent on English? 

b) How long are the breaks in total?

c) How long is the school day?

d) If she has 9 Afrikaans periods per week, how much time is spent in Afrikaans?

---

3.25.8 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.2:** We know this when the learner solves problems involving calculations between appropriate time units, including time zones and differences.

Figure 3.30
3.26 To solve problems involving time units

3.26.1 MATHEMATICS

3.26.2 Measurement and Time

3.26.3 Time

3.26.4 EDUCATOR SECTION

3.26.5 Memorandum

3.26.6

1. \(4 \text{ h } 40 \text{ min} + 24 \text{ h} + 16 \text{ h } 30 \equiv 49 \text{ h } 10 \text{ min} \)
2. \(45 \text{ min} \times 7 = 315 \text{ min} = 5 \text{ h } 15 \text{ min} \)
3. \(08:05 \)
4. \(81 + 365 + 366 + 365 + 365 + 360 + 52 + 2 \text{ 325 days} \times 35 = 105 \text{ km/h} \)
5. \(35 \text{ km in 20 min} \times 3 \times 35 = 105 \text{ km/h} \)
6. \(2 \times 110 \text{ km} = 275 \text{ km} \)
7. \(1 \text{ 50 min} \times 2 \text{ 190 min} = 3 \text{ h } 10 \text{ min} \)
8. \(2 \text{ Yes} \times 10:00 \text{ and 13:15} \times 7.5 = 18:00 \)

3.26.7 LEARNER SECTION

3.26.8 Content

3.26.8.1 ACTIVITY: To solve problems involving time units [LO 4.2]

Work with a partner. Read each problem carefully and then solve it as neatly and accurately as possible.

1. Johan leaves on an excursion at 15:20 on Friday. He arrives back at home at 16:30 on Sunday. How long was he gone?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

2. Heleen practises on her violin for 45 min every day. For how many hours and minutes does she practise every week?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

3. An aeroplane departs for London at 19:40 and lands at Heathrow airport 12 h 25 min later. At what time does the plane land?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

26This content is available online at <http://cnx.org/content/m21101/1.1/>.
4. If Marius was born on 11 October 1962 and John on 21 February 1969, how much older is Marius than John?

5. If it takes me 20 min to cover 35 km at a constant speed, what is my speed? (km/h)

6. Mr Voges travels at a constant speed of 110 km/h. How far will he drive in 2 h?

7. Study the TV programme timetable for SABC3:

![Figure 3.31](image)

7.1 How much time in total is devoted to the news? ____________________________

7.2 How much time is devoted to international business news? ________________

7.3 Are there any educational programmes? _________________________________

7.4 At what times? _____________________________________________________

7.4 For how long does SABC3 broadcast every day? _________________________

ASSESSMENT BY EDUCATOR:
Circle the applicable code:

<table>
<thead>
<tr>
<th>NUMBER CORRECT</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 - 34 - 56 - 7</td>
<td>1234</td>
</tr>
</tbody>
</table>
3.26.9 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.2:** We know this when the solves problems involving calculations between appropriate time units, including time zones and differences.

3.27 To record temperature using degrees Celsius

3.27.1 MATHEMATICS

3.27.2 Measurement and Time

3.27.3 Temperature

3.27.4 EDUCATOR SECTION

3.27.5 Memorandum

1. Temperature
   2. 180 °C
   4. 100 °C
   6. 38 °C
   7. 0 °C
   1.1 –4 °C
   1.2 25 °C
   1.3 –12 °C
   1.4 38 °C
   1.5 –18 °C
   1.6 –10 °C
   2.1 38 °C
   2.2 -18 °C
   3.1 10 °C
   3.2 8 °C
   3.3 6 °C
   3.4 7 °C
   3.5 –3 °C
   4. 6,5 °C; 12,5 °C; 1 °C

ASSESSMENT: MEASURING

1.1 375 mℓ
1.2 0,62 kg
1.3 0,1
1.4 5 000
1.5 2 m
2.1 <
2.2 >
2.3 <
2.4 <

---

27This content is available online at [http://cnx.org/content/m21105/1.1/](http://cnx.org/content/m21105/1.1/).
2.5
3.1 \( l \times b \times h \)
3.2 \((1 \text{ m} \times 1 \text{ m} \times 1 \text{ m}) + (2 \text{ m} \times 2 \text{ m} \times 3 \text{ m})\)
\(= 1 \text{ m}^3 + 12 \text{ m}^3\)
\(= 13 \text{ m}^3\)
4.1 5 °C
23 °C
19 °C
4.2 \( 1380 \div 120 = 11.5\)
11 \( \frac{1}{2} \)h
4.3 \((43 + 41.4 + 39.8 + 42 + 41.2) \div 5\)
\(= 207.4 \div 5\)
\(= 41.48 \) °C
5.1 300 cm \( \times \) 400 cm
3 m \( \times \) 4 m
5.2 3 m \( \times \) 4 m = 12 m²
5.3 \( W (12 \times 8) + (16 \times 2) + (10 \times 2) = 148\)
8 28 + 16 = 44
5.4 \( \frac{44}{148} = \frac{11}{37}\)
6. \( 7 \frac{1}{2} \times 4 \text{ cm}^2\)
\(= 30 \text{ cm}^2\)
7.1 \((175 \text{ mm} \times 6) + (32 \text{ mm} \times 2) + 145 \text{ mm}\)
\(= 1835 \text{ mm}\)
\(= 1.835 \text{ m}\)
7.2 3.165 m
8.1 \((18 \times 4) + (12 \times 2) = 96\)
8.2 40 min + 24 h + 6 h 15 min
\(= 30 \text{ h} 55 \text{ min}\)

3.27.6 LEANER SECTION

3.27.7 Content

Let’s begin by looking at some general questions.

- With what instrument do we measure temperature?
- At what temperature does your mother usually bake a cake?
- What is the temperature of your bath water?
- What is the temperature of boiling water?
- What was the temperature on the hottest day last summer?
- What is the body temperature of a healthy person?
- What temperature is the freezing point of water?

DO YOU REMEMBER THIS?
3.27.7.1 ACTIVITY: To record temperature using degrees Celsius [LO 4.4.4, LO 4.6.4]

1. Read the temperature on each of the following thermometers.
2. Which temperature is:
2.1 the highest: 
2.2 the lowest: 
3. What will the thermometer indicate if the temperature:
3.1 rises by 8 degrees from +2 °C? ______________________________
3.2 rises by 12 degrees from -4 °C? ______________________________
3.3 rises by 7 degrees from -1 °C? ______________________________
3.4 drops by 11 degrees from 18 °C? ______________________________
3.5 drops by 10 degrees from 7 °C? ______________________________
4. What is the reading on the following thermometers?

Figure 3.33

Figure 3.34
ASSESSMENT: MEASURING

1. Complete
   1.1 \( \ell = \frac{\text{_______________________}}{} \) m \( \ell \)
   1.2 \( 2,480 \text{ kg} \div 4 = \frac{\text{_______________________}}{} \) kg
   1.3 \( 360 \div (\frac{\text{_______________________}}{} \times 90) = 40 \)
   1.4 \((20 \times 102) + (3 \times 103) = \frac{\text{_______________________}}{} \)
   1.5 25 % of 8 m = \( \frac{\text{_______________________}}{} \) m

2. Fill in >; <; =
   2.1 \( 0,015 \text{ m} \times 15 \text{ cm} \)
   2.2 \( 1,37 \text{ kg} \times 137 \text{ g} \)
   2.3 1 m \times 1 775 mm
   2.4 72 min \times 1 h
   2.5 5 cups \times 1 \ell

3. Write down a formula for calculating the volume of a cube.

   3.2 Now use this formula to determine the volume of the following shape:
4. Study the map of South Africa.
4.1 What is the difference between the minimum and maximum temperatures predicted for:
   Cape Town? _________________°C
   Sutherland? _________________°C
   Still Bay? _________________°C
4.2 The distance between Cape Town and Johannesburg is 1 380 km.
   If Mr Fourie travels this distance at an average speed of 120 km/h, how long will it take him to reach his destination?

4.3 During January Durban experienced a heat wave. The maximum temperatures for five subsequent days were:
   Mon: 43° C
   Tue: 41,4 °C
   Wed: 39,8 °C
   Thu: 42 °C
   Fri: 41,2° C
   What was the average maximum for these five days?

5. Mrs Marais wants to tile her bathroom in the following pattern.
Each tile is square, with a side of 25 cm.

5.1 What are the measurements of the bathroom?

5.2 What is the area of the bathroom (in m²)?

5.3 How many white and black tiles respectively must Mrs Marais buy? (The sketch only illustrates the pattern, and not the number of tiles).

5.4 Express the black tiles as a fraction of the white tiles (simplify if possible).

6. If each square in the following figure is 2 cm by 2 cm, calculate the size of the area that is coloured in.
7. A gift is decorated with ribbon.

7.1 Calculate the total length of the ribbon used if 14.5 cm was used for the bow alone.

7.2 How much ribbon is left over if 5 m of ribbon was bought?

8. The Blue Train departs from Cape Town for Johannesburg. There are 18 compartments (maximum 4 persons) and 12 coups (maximum 2 persons).
8.1 What is the maximum number of passengers that can be accommodated?

8.2 The train departs on Tuesday at 23:20 from Cape Town and arrives on Thursday at 06:15 in Johannesburg. What is the duration of the journey?

TOTAL: 40
Chapter 4

Term 4

4.1 Recognising and describing angles

4.1.1 MATHEMATICS

4.1.2 Geometry

4.1.3 Volume

4.1.4 EDUCATOR SECTION

4.1.5 Memorandum

Do you remember what the word parallel means? Write down the definition for it:

Invariable
1. A: Yes
B: Yes
2. C
1.
1.1 Obtuse
1.2 Right angle
1.3 Rotation
1.4 Acute
BRAIN-TEASER!
1. Acute
Obtuse
Straight
Right angle
2. Class discussion:

4.1.6 LEANER SECTION

4.1.7 Content

Do you remember what the word parallel means? Write down the definition for it:

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

---

1This content is available online at <http://cnx.org/content/m21117/1.1/>. 
Let's begin with some "puzzles"!
Look at the sketches below and answer the questions that follow:

1. Indicate whether EF and GH are parallel to one another in figure A: __________________________________________________________________ B: __________________________________________________________________
2. Which is the extension of F: C or K?

Do you still remember?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>indicates a line: AB</td>
</tr>
<tr>
<td>E</td>
<td>F</td>
<td>indicates a line segment: EF</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
<td>indicates a radius: CD</td>
</tr>
</tbody>
</table>

Two lines that intersect form an angle.

The point where the lines meet is called the vertex.
We write this as: Ð ABC
• Did you know?

The unit that we use for measuring angles is a degree. We measure the size of the angle in degrees. We write an angle of 60 degrees as $60^\circ$.

You have to learn the different types of angles:

<table>
<thead>
<tr>
<th>Types of angles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The size of a rotation or full turn is $360^\circ$</td>
</tr>
<tr>
<td>2. A straight angle is a half turn and it is $180^\circ$.</td>
</tr>
<tr>
<td>3. A right angle is a quarter turn and it is $90^\circ$.</td>
</tr>
<tr>
<td>4. An acute angle is larger than $0^\circ$, but smaller than $90^\circ$.</td>
</tr>
<tr>
<td>5. An obtuse angle is larger than $90^\circ$, but smaller than $180^\circ$.</td>
</tr>
</tbody>
</table>

**Table 4.2**

**4.1.8 ACTIVITY: Recognising and describing angles [LO 4.11]**

1. How well do you know angles?

   Work with a partner to see if the two of you can tell what the following angles are:
4.1.8.1

4.1.8.2 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.11:** We know this when the learner recognises and describes angles in two-dimensional shapes, three-dimensional objects and the environment.
4.2 Recognising and describing angles

4.2.1 MATHEMATICS

4.2.2 Geometry

4.2.3 Volume

4.2.4 EDUCATOR SECTION

4.2.5 Memorandum

4.2.6 LEANER SECTION

4.2.7 Content

4.2.7.1 ACTIVITY: Recognising and describing angles [LO 4.11]

1. BRAIN-TEASER!
   Work with a partner. Examine the picture. What are the different types of angles that you see?
   Where are they?
   Tell the rest of the class about your answers!

2. Class discussion:
   - What can we use to measure angles accurately?
   - Take a good look at the sketch - or at your own protractor.
   - How do we use the protractor to measure angles?

2This content is available online at <http://cnx.org/content/m21118/1.1/>. 
4.2.8 Assessment

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

**Assessment Standard 4.11:** We know this when the learner recognises and describes angles in two-dimensional shapes, three-dimensional objects and the environment.

4.3 To recognise and describe angles

4.3.1 MATHEMATICS

4.3.2 Geometry

4.3.3 Volume

4.3.4 EDUCATOR SECTION

4.3.5 Memorandum

1.
1.1 52º
1.2 130º
1.3 90º
1.4 28º
2
2.1 Acute
2.2 Acute

---

*This content is available online at [http://cnx.org/content/m21121/1.1/].*
2.3 Acute
2.4 Obtuse

4.3.6 LEANER SECTION

4.3.7 Content

4.3.7.1 ACTIVITY: To recognise and describe angles [LO 3.2.3, LO 4.11]

1. Use your protractor to measure the following angles. Then explain what type of angle each one is.

1.1

![Figure 4.6](image)

Figure 4.6

1.2

![Figure 4.7](image)

Figure 4.7

1.3

![Figure 4.8](image)

Figure 4.8
1.4

2. Complete the table. First estimate the sizes of the angles and then measure them accurately.

<table>
<thead>
<tr>
<th>Angle</th>
<th>Estimated</th>
<th>Measured</th>
<th>Type of angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*continued on next page*
4.3.8 Assessment

**Learning Outcome 3:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

*Assessment Standard 3.2:* We know this when the learner describes and classifies two-dimensional shapes and three-dimensional objects in terms of properties including:

3.2.3: angle size of corners;

**Learning Outcome 4:** The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

*Assessment Standard 4.11:* We know this when the learner angles smaller than right angles.

4.4 To recognise and name 2-dimensional figures

4.4.1 MATHEMATICS

4.4.2 Geometry

4.4.3 Volume

4.4.4 EDUCATOR SECTION

4.4.5 Memorandum

1.1 parallelogram

1.2 trapezium

1.3 right angle

1.4 rhombus

1.5 kite

1.6 quadrangle

1.7 trapezium

1.8 square

Let’s do revision!

---

4 This content is available online at <http://cnx.org/content/m21123/1.1/>.
• When do we say that a figure is symmetrical?

Centre line reflected

• Which of the above figures are symmetrical?

1.3 / 1.4 / 1.5 / 1.8

4.4.6 LEANER SECTION

4.4.7 Content

4.4.7.1 ACTIVITY: To recognise and name 2-dimensional figures [LO 3.1.1, LO 3.1.2]

1. Class discussion:
   Can you give the names for the following figures? Work with a partner and write down all the names:

---

Figure 4.10

---

4.4.8 Assessment

**Learning Outcome 3:** The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

**Assessment Standard 3.1:** We know this when the learner recognises, visualises and names two-dimensional shapes and three-dimensional objects in natural and cultural forms and geometric settings, including those previously dealt with and focusing on:
3.1.1: similarities and differences between tetrahedrons and other pyramids;
3.1.2: similarities and differences between rectangles and parallelograms.

4.5 To describe 2-dimensional figures in terms of different properties

4.5.1 MATHEMATICS

4.5.2 Geometry

4.5.3 EDUCATOR SECTION

4.5.4 Memorandum

4.5.5 Learner Section

4.5.6 Content

1. Have a class discussion on the properties of each of the figures given above with regard to the following:
   (i) Number of sides and lengths
   (ii) Number of angles, types of angles and sizes
   (iii) Number of vertices

2. Work in groups of three. Choose any two of the above figures, e.g. a rectangle and a parallelogram. Design a poster on which you set out the differences and similarities of the two figures neatly. Display the poster so that the rest of the learners in the class can see it.

   Evaluate your work on a scale 1 - 4 by circling the appropriate number:

   ![Figure 4.11](http://cnx.org/content/m31671/1.1/)

Let’s do revision!

- When do we say that a figure is symmetrical?

---

5This content is available online at [http://cnx.org/content/m31671/1.1/](http://cnx.org/content/m31671/1.1/).
• Which of the above figures are symmetrical?

DID YOU KNOW?
A design that fits into its outlines more than once, has rotational symmetry. The number of times that a design fits into its own outlines is referred to as the order of symmetry.

![Figure 4.12]

Figure 4.12

4.5.7 Assessment
Learning Outcome 3: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 3.2: We know this when the learner describes and classifies two-dimensional shapes and three-dimensional objects in terms of properties.

4.6 To use the vocabulary and properties of rotations to describe the relationships between 2-D shapes⁶

4.6.1 MATHEMATICS
4.6.2 Geometry
4.6.3 Volume
4.6.4 EDUCATOR SECTION
4.6.5 Memorandum

1. 1.1 2
   1.2 6
2. 2.1 Yes
2.2 Yes
2.3 No
3. 4 2
4. 3

⁶This content is available online at <http://cnx.org/content/m21125/1.1/>.
4.6.6 LEANER SECTION

4.6.7 Content

4.6.7.1 ACTIVITY: To use the vocabulary and properties of rotations to describe the relationships between 2-D shapes [LO 3.4]

1. Trace the following figures and cut them out neatly.

1.1 Determine how many times the design will fit into its outlines:
Figure 1: _________________________________________________________________
Figure 2: _________________________________________________________________

2. Determine whether the following figures have rotational symmetry:
2.1 _________________________________________________________________

Figure 4.13

Figure 4.14

Figure 4.15
2.2
_______________________________
2.3

3. Complete: A square has an order of symmetry of ______________________
A rectangle has an order of symmetry of ________________________________
4. Does a triangle have rotational symmetry? _______________________________

4.6.8 Assessment

Learning Outcome 3: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 3.4: We know this when the learner uses the vocabulary and properties of rotations, reflections and translations to describe the relationships between distinct two-dimensional shapes and three-dimensional objects within patterns (including transformations and symmetry).

4.7 To draw enlargements and reductions of 2-dimensional figures

4.7.1 MATHEMATICS

4.7.2 Geometry

4.7.3 EDUCATOR SECTION

4.7.4 Memorandum

4.7.5 Learner Section

4.7.6 Content

4.7.6.1 ACTIVITY: To draw enlargements and reductions of 2-dimensional figures [LO 3.3.2, LO 3.5]

Sometimes it is necessary to enlarge or reduce a figure. Think of a picture you want to photostat that has to fit into a smaller space, or captions that you want to enlarge to use as directions against the passage wall.

---

7This content is available online at <http://cnx.org/content/m31673/1.1/>.
Let's see how you do it on your own!
1. Use grid paper and:
   1.1 enlarge the square three times;
   1.2 reduce the rectangle once;
   1.3 double the size of the triangle.

2. Now compare your drawings with the originals. What do you observe when you compare the shapes? CHALLENGE!
   Can you draw an exact copy of the elephant in the larger squares?
4.7.7 Assessment

Learning Outcome 3: The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standard 3.3: We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.2: drawing shapes on grid paper;

Assessment Standard 3.5: We know this when the learner draws enlargements and reductions of two-dimensional shapes (at least quadrilaterals and triangles), using grid paper to compare their size and shape.

4.8 To investigate and compare 2-dimensional figures

4.8.1 MATHEMATICS

4.8.2 Geometry

4.8.3 EDUCATOR SECTION

4.8.4 Memorandum

1.

1.1 Equally from centre
2.
2.1 180
2.2 1
2.3 360

8This content is available online at <http://cnx.org/content/m21129/1.1/>.
4.8.5 LEANER SECTION

4.8.6 Content

4.8.6.1 ACTIVITY: To investigate and compare 2-dimensional figures [LO 3.3.3]

Looking at circles:
1. Have a good look at the sketch and then answer the questions:

RQ = Diameter
SP = Radius
1.1 What is a circle?
_____________________________________________________________________
1.2 Where do we come across circles in our daily lives?
_____________________________________________________________________
_____________________________________________________________________

2. Answer the following questions:
2.1 How many diameters could a circle have? _____________________________
2.2 How many centre points could a circle have? __________________________
2.3 How many radii could a circle have? ________________________________

3. Use a pair of compasses and draw a circle with a:
3.1 radius of 30 mm:
3.2 diameter of 80 mm:

DID YOU KNOW?
We can draw lovely patterns based on circles! The pattern shown below is known as a paisley design and is used on cloth or clothing.

Figure 4.20

4. Can you find out how the pattern is created? Try to do it yourself!
5. Follow the steps and use this method for drawing the patterns that follow. Your educator will provide the paper that you need.

Draw a circle Use the same radius for marking the circumference Connect the points (if necessary)
Draw a circle

Figure 4.22

Use the same radius for marking the circumference

Figure 4.23

Connect the points (if necessary)

Figure 4.24

5.1

Figure 4.25

5.2
6. Design your own pattern with circles. Colour it neatly:

Time for self-assessment

It is important to know how well you understand the work that we have done up to now. Read the following criteria. Evaluate yourself on a scale ranging from 1 to 4 by circling the appropriate number.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1 = Not at all</th>
<th>2 = Just a little</th>
<th>3 = Well</th>
<th>4 = Very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can explain the term &quot;parallel&quot;.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*continued on next page*
<table>
<thead>
<tr>
<th>I can explain</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>the difference between a line and a line segment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can explain the following concepts:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* acute angle;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>* obtuse angle;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>* right angle.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can use a protractor to:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* measure angles accurately;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>* draw angles accurately.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can name the similarities between a rectangle and a parallelogram</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can name the differences between a rectangle and a parallelogram.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can explain the concept &quot;symmetrical&quot;.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can explain the concept &quot;rotational symmetry&quot;.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*continued on next page*
I can explain the following concepts:

- radius
- diameter

I could enlarge and reduce the figures.

I can use circles to draw patterns.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>* radius;</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>* diameter</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I could enlarge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>and reduce the</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>figures.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use circles</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>to draw patterns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.5

Let’s look at 3-dimensional figures.

You probably quite often play games that require a die. See if you can make one yourself. Trace the outlines of the following net exactly. Cut it out neatly and fold it to form a die. Then write the numbers 1 to 6 on the sides. Remember that the numbers of the following number pairs (1, 6), (3, 4) and (2, 5) must be on opposite sides.

Figure 4.29

DID YOU KNOW?
The die that you have just made is an example of a cube.
Take a good look at the following:

Figure 4.30

4.8.7 Assessment

**Learning Outcome 3:** The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.
Assessment Standard 3.3: We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.3: using a pair of compasses to draw circles, patterns in circles, and patterns with circles.

4.9 To describe and classify 3-dimensional figures

4.9.1 MATHEMATICS

4.9.2 Geometry

4.9.3 EDUCATOR SECTION

4.9.4 Memorandum

<table>
<thead>
<tr>
<th>Figure</th>
<th>Number of edges</th>
<th>Number of faces</th>
<th>Number of vertices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>9</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Diagram" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>18</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Diagram" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*continued on next page*

---

*This content is available online at [http://cnx.org/content/m21131/1.1/].*
4.9.5 LEANER SECTION

4.9.6 Content

4.9.6.1 ACTIVITY: To describe and classify 3-dimensional figures [LO 3.2.1]

Look at the following figures and complete the table:

<table>
<thead>
<tr>
<th>Figure</th>
<th>Number of edges</th>
<th>Number of faces</th>
<th>Number of vertices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6
4.9.7 Assessment

Learning Outcome 3: The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.2: We know this when the learner describes and classifies two-dimensional shapes and three-dimensional objects in terms of properties including:

3.2.1: faces, vertices and edges.

4.10 To recognise, visualise and name 3-dimensional figures¹⁰

4.10.1 MATHEMATICS

4.10.2 Geometry

4.10.3 EDUCATOR SECTION

4.10.4 Memorandum

4.10.5 Learner Section

4.10.6 Content

4.10.6.1 ACTIVITY: To recognise, visualise and name 3-dimensional figures [LO 3.1.1]

4.10.6.2 To investigate and compare 3-dimensional figures [LO 3.3.1]

1. The following nets are examples of pyramids.

Trace them exactly, cut them out and fold each pyramid.

¹⁰This content is available online at <http://cnx.org/content/m31674/1.1/>.
2. Hold a class discussion and draw up a list of the similarities and differences that you notice between the two pyramids.

4.10.7 Assessment

**Learning Outcome 3**: The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

**Assessment Standard 3.1**: We know this when the learner recognises, visualises and names two-dimensional shapes and three-dimensional objects in natural and cultural forms and geometric settings, including those previously dealt with and focusing on:

3.1.1: similarities and differences between tetrahedrons and other pyramids.

**Assessment Standard 3.3**: We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.1: making three-dimensional models using:

- drinking straws to make a skeleton,
- nets provided by the teacher;
4.11 To investigate and compare 3-dimensional figures

4.11.1 MATHEMATICS

4.11.2 Geometry

4.11.3 EDUCATOR SECTION

4.11.4 Memorandum

2.1 3-dimensional One level
   2.2 One level 3-dimensional

4.11.5 LEARNER SECTION

4.11.6 Content

4.11.6.1 ACTIVITY: To investigate and compare 3-dimensional figures [LU 3.3.1]

Let's do some building!

1. Work with a partner. Use drinking straws or toothpicks and prestick and see whether you are able to build the following 3-dimensional figures:
   1.1 a cube
   1.2 a triangular prism
   1.3 a pyramid
   1.4 any other 3-dimensional figure

2. Now answer the following questions:

2.1 How does a cube differ from a square?

2.2 How does a triangle differ from a triangular prism?

4.11.7 Assessment

**Learning Outcome 3:** The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

**Assessment Standard 3.3:** We know this when the learner investigates and compares (alone or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:

3.3.1: making three-dimensional models using:

- drinking straws to make a skeleton,
- nets provided by the teacher;

---

111This content is available online at <http://cnx.org/content/m21134/1.1/>. 
4.12 To draw and interpret sketches

4.12.1 MATHEMATICS

4.12.2 Geometry

4.12.3 EDUCATOR SECTION

4.12.4 Memorandum

1. 4
   2
   2.1 19
   2.2 8

4.12.5 Learner Section

4.12.6 Content

4.12.6.1 ACTIVITY: To draw and interpret sketches [LO 3.7]

1. Take a good look at this sketch of a cube.
   How many squares are not visible when you view it from the front?

   \[ \text{Figure 4.32} \]

2. View the cube from the side.
   2.1 How many cubes do you see?
   2.2 How many cubes are invisible?

3. Now draw any one of these cubes from above.
   CHALLENGE!
   Ask your educator for the sheet of paper that you will need.
   - Take off one of your school shoes:
   - Draw it from above.
   - Draw it from the side.

---

\[ ^{15} \text{This content is available online at } \text{<http://cnx.org/content/m31683/1.1/>}. \]
• Draw it from below.

Time for self-assessment
Read the criteria. How do you feel about the work that we have just completed? Colour the face that is true for you.

DID YOU KNOW?
We can make use of co-ordinates when we need to read a map or directions. It is important to know that we always have to read the horizontal axis first.
In this example, point A reads as paired numbers (1,2).
If you read the pair (3,1), you will arrive at B.
Sometimes direction is also given, and then it is: (1E, 2N) or (3E, 1N).
4.12.7 Assessment

Learning Outcome 3: The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.7: We know this when the learner draws and interprets sketches of simple three-dimensional objects from different positions (perspectives).

4.13 To find specific positions and explaining how to move between positions\(^{13}\)

4.13.1 MATHEMATICS

4.13.2 Geometry

4.13.3 EDUCATOR SECTION

4.13.4 Memorandum

1.
   1.1 Church
   1.2 Movies
   1.3 Factory
   1.4 Museum
   2
   2.1 2 N and 8 W
   2.2 1N and 6 W
   2.3 3N and 5W
   2.4 1N and 8E

4.13.5 LEARNER SECTION

4.13.6 Content

4.13.6.1 ACTIVITY: To find specific positions and explaining how to move between positions [LO 3.8]

1. Nino is a stranger to the town. Explain what he will see if he visits the following "points".

\(^{13}\)This content is available online at <http://cnx.org/content/m21140/1.1/>. 
1.1 (6E, 1S): ______________________________________________________
1.2 (3W, 3N): _____________________________________________________
1.3 (5W, 3S): _____________________________________________________
1.4 (5E, 7N): _____________________________________________________

2. Using co-ordinates only, tell Nino how to get:
2.1 from the airport to the factory:
___________________________________________________________________
2.2 from the estuary to the movies:
___________________________________________________________________
2.3 from the station to the shopping centre:
___________________________________________________________________
2.4 from the zoo to the museum:
___________________________________________________________________

CHALLENGE!
Design a map of your own, with directions. Bury a treasure somewhere and use co-ordinates to direct your partner to find it.

4.13.7 Assessment
Learning Outcome 3: The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standard 3.8: We know this when the learner locates positions on a coded grid, describe how to move between positions on the grid, and recognises maps as grids.
4.14 To do mental calculations

4.14.1 MATHEMATICS

4.14.2 Data Handling

4.14.3 EDUCATOR SECTION

4.14.4 Memorandum

1.1 \( 9 \times 12 = 108 \)
1.2 \( 7 \times 8 = 56 \)
1.3 \( 6 \times 8 = 48 \)
1.4 \( 13 \times 5 = 65 \)
1.5 \( (4 \times 6) + 18 = 42 \)
1.6 \( (4 \times 8) + 8 = 40 \)
1.7 \( 144 \div 12 \div 6 = 2 \)
1.8 \( 2004 - 13 = 1991 \)
1.9 \( 54 \div 6 = 9 \)
1.10 \( 63 \div 7 = 9 \)
1.11 \( 132 \div 12 = 11 \)
1.12 \( 4 \times 4 \times 4 = 64 \)
1.13 \( 72 \div 9 = 8 \)
1.14 \( (81 \div 9) \times 4 = 36 \)
1.15 \( 15 \times 7 \times 6 \times 0 = 0 \)

4.14.5 LEANER SECTION

4.14.6 Content

4.14.6.1 ACTIVITY: To do mental calculations [LO 1.9]

1. It has been a long time since we checked to see how good your mental arithmetic skills are! See if you can complete the following mental arithmetic test within two minutes:

1.1 \( 9 \times 12 = \)
1.2 \( 7 \times 8 = \)
1.3 \( 6 \times = 48 \)
1.4 \( \times 5 = 65 \)
1.5 \( (4 \times 6) + 18 = \)
1.6 \( (4 \times ) + 8 = 40 \)
1.7 \( \div 12 \div 6 = 2 \)
1.8 \( 2004 - 13 = \)
1.9 \( 54 \div = 9 \)
1.10 \( \div 7 = 9 \)
1.11 \( 132 \div 12 = \)
1.12 \( 4 \times 4 \times 4 = \)
1.13 \( 72 \div = 8 \)
1.14 \( (\div 9) \times 4 = 36 \)
1.15 \( 15 \times 7 \times 6 \times 0 = 0 \)

Fill in: I got ______________________ correct!

---

14This content is available online at <http://cnx.org/content/m21144/1.1/>.
4.14.7 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations.

4.15 To use simple tables to collect data and answer questions

4.15.1 MATHEMATICS

4.15.2 Data Handling

4.15.3 EDUCATOR SECTION

4.15.4 Memorandum

4.15.5 LEARNER SECTION

4.15.6 Content

4.15.6.1 ACTIVITY: To use simple tables to collect data and answer questions [LU 5.2]

4.15.6.2 To organise and record data [LU 5.4]

1. Let’s do a survey of the results obtained by the class in the mental arithmetic test. Complete the following simple table:

<table>
<thead>
<tr>
<th>Number of questions answered correctly</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
</table>

| Number of learners | __ | __ | __ | __ | __ | __ | __ | __ | __ | __ | __ | __ | __ | __ | __ |

**Table 4.8**

2. Answer the following questions according to the above table:

1. How many learners wrote the mental arithmetic test? ____________________

2. How many learners attained full marks? ________________________________

3. How many learners only answered 8 questions correctly? ________________

4. How many questions were answered correctly by most of the learners? ______

5. Was it an easy mental arithmetic test? ________________________________

Motivate your answer: ____________________________________________
_________________________________________________________________

CLASS DISCUSSION

Discuss the following and see if you can arrive at answers.

---

15This content is available online at <http://cnx.org/content/m31675/1.1/>.
1. Why do you think it is important for your principal to know exactly how many learners will be in each class next year?
2. Why do you think it is important to know how many people there are in a town?
3. How could one obtain the above information?

4.15.7 Assessment

**Learning Outcome 5:** The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

**Assessment Standard 5.2:** We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone or as a member of a group or team) to answer questions posed by the teacher, class and self,

**Assessment Standard 5.4:** We know this when the learner organises and records data, using tallies and tables.

4.16 To ask simple questions and identify sources of data

4.16.1 MATHEMATICS

4.16.2 Geometry

4.16.3 EDUCATOR SECTION

4.16.4 Memorandum

4.16.5 Learner Section

4.16.6 Content

4.16.6.1 ACTIVITY: To draw enlargements and reductions of 2-dimensional figures [LO 3.3.2, LO 3.5]

For this activity you must divide into three groups. Choose one of the following subjects. Then choose one class in the school from whom you can collect the information.

- Favourite sport
- Favourite TV programme
- Favourite learning area at school
- Favourite pet
- Favourite weekend pastime

Compile a table to record the information, e.g.:

<table>
<thead>
<tr>
<th>Favourite sport</th>
<th>Hockey</th>
<th>Netball</th>
<th>Soccer</th>
<th>Rugby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Learners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.9

---

16\(^{16}\)This content is available online at <https://cnx.org/content/m31676/1.1/>.
4.16.7 Assessment

**Learning Outcome 5:** The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

**Assessment Standard 5.1:** We know this when the learner poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

**Assessment Standard 5.4:** We know this when the learner organises and records data, using tallies and tables.

4.17 To draw a number of different graphs

4.17.1 MATHEMATICS

4.17.2 Geometry

4.17.3 EDUCATOR SECTION

4.17.4 Memorandum

4.17.5 Learner Section

4.17.6 Content

4.17.6.1 ACTIVITY: To draw a number of different graphs [LO 5.6]

We can represent the information we collect in a wide variety of ways, such as block graphs, bar graphs, line graphs, pictographs and pie graphs.

Let us have a look at a number of examples:

---

![Graph Example](http://cnx.org/content/m31678/1.1/)

*Figure 4.36*

---

¹⁷This content is available online at <http://cnx.org/content/m31678/1.1/>. 
4.17.6.1.1 Bar line graph

Figure 4.37

4.17.6.1.2 Circle diagram

Figure 4.38

4.17.8
4.17.9
4.17.10
4.17.11
Pictogram
A horizontal block graph

A vertical bar graph

1. Now choose one of these graphs and present the information collected in the previous module neatly.
Assessment: Graph

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis</td>
<td>No axis has a caption.</td>
<td>Only one axis has a caption.</td>
<td>Both axes have captions but not correctly.</td>
<td>Both axes have correct and neat captions.</td>
</tr>
<tr>
<td>Graph</td>
<td>Interpretation almost impossible.</td>
<td>Interpretation difficult and the data is unorganised.</td>
<td>Graph can be interpreted but is not 100% correct.</td>
<td>The graph is organised and data presented meaningfully. Easy to interpret.</td>
</tr>
<tr>
<td>Neatness</td>
<td>Work is untidy and unorganised.</td>
<td>Organised but difficult to read.</td>
<td>Neat, organised and easy to read.</td>
<td>Neat, clearly set out and very easy to read.</td>
</tr>
</tbody>
</table>

Table 4.10

4.17.12 Assessment

Learning Outcome 5: The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.6: We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped).
4.18 To read and interpret data critically

4.18.1 MATHEMATICS

4.18.2 Geometry

4.18.3 EDUCATOR SECTION

4.18.4 Memorandum

1.
  1.1 4
  1.2 e.TV
  1.3 Egoli
  1.4 2 / 3
  1.5 Hooked on Golf
  1.6 14:00 en 17:00
  1.7 SABC 3 and e.TV
  1.8 Which of these TV Channels is your favourite? Why?

4.18.5 Learner Section

4.18.6 Content

4.18.6.1 ACTIVITY: To read and interpret data critically [LO 5.7.1]

1. You have drawn your own graph, now let us see if you are able to interpret data that is presented in another way. Look carefully at the following and answer the questions that follow:

---

18This content is available online at <http://cnx.org/content/m31679/1.1/>. 
1.1 Programmes from how many different TV channels are presented here?

1.2 On which channel will you be able to see the movie "Two Women"?

1.3 Which programme are you able to see on both M-Net and kykNet?

1.4 How many SABC 3 programmes are repeated?

1.5 Which sports programme are you able to watch on kykNet?

1.6 At what time is there a children’s programme on M-Net?

1.7 Which channel begins their transmission earliest?

1.8 Which of these TV Channels is YOUR favourite?

Why?

4.18.7 Assessment

Learning Outcome 5: The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.7: We know this when the learner critically reads and interprets data presented in a variety of ways (including own representations, representations in the media - words, graphs, pie graphs)
to draw conclusions and make predictions sensitive to the role of:
5.7.1: context (e.g. rural or urban, national or provincial).

4.19 To examine ungrouped numerical data to determine the mode and the median\textsuperscript{19}

4.19.1 MATHEMATICS
4.19.2 Data Handling
4.19.3 EDUCATOR SECTION
4.19.4 Memorandum
1. 1.1 45
   • 45
   • 41,5
2. 2.1 18 / 13
   • 6
3. 3.1 17 / 19
   • 38
4. 4.1 5,5
   • 13,7
5. 5.1 Class / Subject

4.19.5 LEANER SECTION
4.19.6 Content
4.19.6.1 ACTIVITY: To examine ungrouped numerical data to determine the mode and the median [LO 5.5]

By this time you will have realised that data can be represented in numerous ways. Let us see how data can be used within the school situation:

Mr Marvin’s class has written a Mathematics test for a total of 50 marks and the boys’ results are as follows:
47 ; 33 ; 45 ; 49 ; 38 ; 45 ; 42 ; 45 ; 30

Instead of representing the data by means of a graph, Mr Marvin has calculated the mode, median and arithmetical average.

DID YOU KNOW?
The mode of the data is the value that appears most often.
Sometimes there is more than one mode.
The median of the data is the value in the middle when the data is arranged from small to big.
If there is an equal number of values, the median is the average of the two

\textsuperscript{19}This content is available online at <http://cnx.org/content/m21845/1.1/>. 
middle numbers.
The arithmetical average is what you get when all the values are added
together and divided by the number of values.
1. Let us help Mr Marvin calculate the following:
1.1 The mode:
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
1.2 The median:
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
1.3 The arithmetical average:
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
2. Determine the mode of:
2.1 18 ; 13 ; 15 ; 18 ; 19 ; 12 ; 13 ; 14
2.2 5 ; 6 ; 7 ; 9 ; 8 ; 7 ; 6 ; 8 ; 9
3. Determine the median of:
3.1 17 ; 15 ; 23 ; 15 ; 19 ; 29
3.2 41 ; 29 ; 50 ; 33 ; 45 ; 27 ; 38
4. Determine the arithmetical average of:
4.1 5 ; 7 ; 8 ; 3 ; 4 ; 9 ; 2 ; 6
4.2 11 ; 14 ; 16 ; 12 ; 13 ; 15 ; 15
5. Answer the following questions:
5.1 What arithmetical average does your educator determine regularly?
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
5.2 Why?
_____________________________________________________________________
_____________________________________________________________________

4.19.7 Assessment

**Learning Outcome 5:** The learner will be able to collect, summarise, display and critically analyse data in
order to draw conclusions and make predictions, and to interpret and determine chance variation.

**Assessment Standard 5.5:** We know this when the learner examines ungrouped numerical data to
determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order
to describe central tendencies.
4.20 To ask simple questions and identifying sources of data

4.20.1 MATHEMATICS

4.20.2 Geometry

4.20.3 EDUCATOR SECTION

4.20.4 Memorandum

4.20.5 Learner Section

4.20.6 Content

4.20.6.1 ACTIVITY: To ask simple questions and identifying sources of data [LO 5.1]

4.20.6.2 To use simple tables to collect data and answer questions [LO 5.2]

4.20.6.3 To organise and record data [LO 5.4]

4.20.6.4 To examine ungrouped numerical data and determining the mode, median and arithmetical average [LO 5.5]

4.20.6.5 To draw a variety of graphs [LO 5.6]

4.20.6.6 To read and interpret data critically [LO 5.7.2]

**This is an assignment for your portfolio. Read the instructions attentively before you begin working.

1. Record the shoe sizes of all the children in any class (besides your own) in the school
2. Present the information neatly in a table
3. Now present the information by means of a graph of your own choice
4. Determine the mode of the data
5. Determine the arithmetical average
6. Note down any interesting facts about the data that you have collected

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Hardly any of the instructions have been carried out.</td>
</tr>
<tr>
<td>Neatness and organisation</td>
<td>Work is untidy and unorganised.</td>
</tr>
</tbody>
</table>

continued on next page
Graph | Virtually impossible to interpret. | Data unorganised and difficult to interpret. | Graph can be interpreted but is not 100% correct. | The graph is ordered and data presented meaningfully. Easy to interpret.
---|---|---|---|---
Correctness of calculations | All answers are incorrectly calculated. | Many mistakes made. | Few mistakes have been made. | All answers are correctly calculated.

Table 4.11

4.20.7 Assessment

**Learning Outcome 5:** The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

**Assessment Standard 5.1:** We know this when the learner poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment;

**Assessment Standard 5.2:** We know this when the learner uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone or as a member of a group or team) to answer questions posed by the teacher, class and self;

**Assessment Standard 5.4:** We know this when the learner organises and records data, using tallies and tables;

**Assessment Standard 5.5:** We know this when the learner examines ungrouped numerical data to determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order to describe central tendencies;

**Assessment Standard 5.6:** We know this when the learner draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped);

**Assessment Standard 5.7:** We know this when the learner critically reads and interprets data presented in a variety of ways (including own representations, representations in the media - words, graphs, pie graphs) to draw conclusions and make predictions sensitive to the role of:

5.7.2: categories (e.g. age, gender, race).

4.21 To predict the likelihood of events in everyday life

4.21.1 MATHEMATICS

4.21.2 Probability

4.21.3 EDUCATOR SECTION

4.21.4 Memorandum

1.
1.1 Possible
1.2 Possible
1.3 Certain
1.4 Possible
1.5 Impossible
1.6 Possible

---

21This content is available online at <http://cnx.org/content/m21844/1.1/>. 
1.7 Impossible
1.8 Impossible
1.9 Certain
1.10 Possible

4.21.5 LEARNER SECTION

4.21.6 Content

4.21.6.1 ACTIVITY: To predict the likelihood of events in everyday life [LO 5.8]

1. Work with a friend. Decide whether the following is certain, possible or impossible. Put a tick in the appropriate column:

<table>
<thead>
<tr>
<th></th>
<th>Certain</th>
<th>Possible</th>
<th>Impossible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 It will rain on Wednesday.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2 If you throw a die, it will land on 3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 Sunday comes before Monday.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 The netball team will win their game.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 You can fly from Durban to Cape Town in 15 minutes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6 I will get full marks for my next test.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7 There will be no school holidays next year.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.8 I will turn 10 on my next birthday.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9 Thursday comes before Wednesday.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10 I am going to win R1 000.00.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.12

DID YOU KNOW?
4 You were actually estimating the probability of things happening or not. We can link numbers to the estimations.
A probability of one means that the event will definitely take place.
A probability of nought means that the event will definitely not take place.
We can determine the probability of something taking place as follows:
The number of times that the event can take place
Total number of possibilities
The probability of taking a red ball out of a container holding 2 red and 3 blue balls therefore is:
(there are 2 red balls)
(there are 5 balls altogether)

4.21.7 Assessment

Learning Outcome 5: The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.8: We know this when the learner predicts the likelihood of events in daily life based on observation, and places them on a scale from 'impossible' to 'certain'.

4.22 To list possible outcomes to simple experiments

4.22.1 MATHEMATICS

4.22.2 Probability

4.22.3 EDUCATOR SECTION

4.22.4 Memorandum

1. \( \frac{2}{12} \cdot \frac{5}{4} = \frac{2}{3} \)
2. \( \frac{6}{16} = \frac{3}{8} \)
3. \( \frac{1}{2} \cdot \frac{3}{5} = \frac{3}{10} \)
4. \( \frac{4}{5} \cdot \frac{1}{2} = \frac{2}{5} \)

4.22.5 LEARNER SECTION

4.22.6 Content

4.22.6.1 ACTIVITY: To list possible outcomes to simple experiments [LO 5.9]

Determine the probability in the following cases:

1. Two dice are rolled simultaneously. What is the probability of one die landing on 1?

2. There are two pairs of white and one pair of black socks in my drawer. What is the probability of taking out a white sock without looking?

3. There are five forks, five knives and six spoons lying together in the cutlery drawer. What is the probability of taking out a spoon?

4. What is the probability of a coin landing on ‘tails’ when tossed into the air?

5. Look at the following sketch. What is the probability of the pointer not stopping on P when it is spun?

---

22This content is available online at <http://cnx.org/content/m21843/1.1/>. 
4.22.7 Assessment

**Learning Outcome 5:** The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

**Assessment Standard 5.9:** We know this when the learner lists possible outcomes for simple experiments (including tossing a coin, rolling a die, and spinning a spinner);

4.23 To count the frequency of actual outcomes for a series of trials

4.23.1 MATHEMATICS

4.23.2 Geometry

4.23.3 EDUCATOR SECTION

4.23.4 Memorandum

4.23.5 Learner Section

4.23.6 Content

4.23.6.1 ACTIVITY: To count the frequency of actual outcomes for a series of trials [LO 5.10]

1. Work with a friend. Throw a die 20 times and record each time that it lands on a 4.
   Fill in: number of times: ________________________________________________
   2. Work with a friend. Toss a coin into the air 20 times and note each time it falls on 'heads'.
   Fill in: number of times: ________________________________________________
   **DID YOU KNOW?**
   The number of times that were recorded above is referred to as the relative frequency.
   If the 4 had shown up 9 times in the above example, we would calculate the relative frequency as follows:
   Relative frequency = number of fours number of throws
   \[
   = \frac{9}{20} \quad (4.1)
   \]

---

---

**Note:** This content is available online at [http://cnx.org/content/m31681/1.1/](http://cnx.org/content/m31681/1.1/).
3. Throw the die 30 times and see how often it lands on 2.
   Calculate the relative frequency.

Time For Self-Assessment
It is important to know if you have understood the last part of the work. Read the criteria below. Evaluate yourself on a scale of 1-4 by circling the appropriate number.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1 = Not at all</th>
<th>2 = Just a little</th>
<th>3 = Well</th>
<th>4 = Very well</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am able to explain the concept of &quot;probability&quot;.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can explain what a probability of one means.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can explain what a probability of nought means.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>I can determine probability correctly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I can determine relative frequency correctly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4.13

4.23.7 Assessment

Learning Outcome 5: The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standard 5.10: We know this when the learner counts the frequency of actual outcomes for a series of trials.
4.24 To do mental arithmetic

4.24.1 MATHEMATICS

4.24.2 Probability

4.24.3 EDUCATOR SECTION

4.24.4 Memorandum

1. $6 \times 7 = 42$
2. $7 \times 9 = 63$
3. $6 \times 7 = 42$
4. $9 \times 5 = 45$
5. $(4 \times 12) + 13 = 61$
6. $(6 \times 8) + 8 = 56$
7. $144 \div 12 \div 6 = 2$
8. $2001 - 17 = 1984$
9. $72 \div 8 = 9$
10. $24 \div 3 = 8$
11. $132 \div 11 = 12$
12. $3 \times 3 \times 3 = 27$
13. $96 \div 12 = 8$
14. $(30 \div 6) \times 4 = 20$
15. $13 \times 6 \times 8 \times 0 = 0$

TEST

1. 1 straight angle
2. Obtuse angle
3. Acute angle

2. • $40^\circ$
• $150^\circ$

3. 3.1 No
3.2 Yes
4. 8; 8; 6
5. The ages of ten teachers are as follows:
23; 23; 29; 35; 41; 42; 42; 42; 47, 53
5.1 42
5.2 41 / 42
5.3 37.7
6. Total number of times it took place
Total number of possibilities
7. 7.1 7
7.2 7
4.24.5 LEANER SECTION

4.24.6 Content

4.24.7 ACTIVITY: To do mental arithmetic [LO 1.9]

Let's round off the year's work with our last mental arithmetic test. Test your skill by answering the following questions as quickly and correctly as possible:

1. \(6 \times 7 = \) _____________________
2. \(7 \times 9 = \) _____________________
3. \(6 \times \) _____________________ = 42
4. ___ \(\times 5 = 45\)
5. \((4 \times 12) + 13 = \) _____________________
6. \((6 \times \) _____________________ \() + 8 = 56\)
7. _____________________ \(\div 12 \div 6 = 2\)
8. \(2001 - 17 = \) _____________________
9. \(72 \div \) _____________________ = 9
10. _____________________ \(\div 3 = 8\)
11. \(132 \div 11 = \) _____________________
12. \(3 \times 3 \times 3 = \) _____________________
13. \(96 \div \) _____________________ = 8
14. \((\) _____________________ \(\div 6) \times 4 = 20\)
15. \(13 \times 4 \times 8 \times \) _____________________ = 0

Complete: I had _____________________ correct!

TEST

1. What kind of angles are the following?

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>(\overrightarrow{AC})</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>(\overrightarrow{CD})</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>(\angle E)</td>
</tr>
</tbody>
</table>

continued on next page
2. Measure the following angles with your protractor:

<table>
<thead>
<tr>
<th>G</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 2.1</td>
<td>K</td>
</tr>
</tbody>
</table>

3. Do the following figures have rotational symmetry?

<table>
<thead>
<tr>
<th>3.1</th>
<th>3.2</th>
</tr>
</thead>
</table>

4. Complete: A cube has _______________ edges; ________________ angular points and _________________________________ faces.

5. The ages of ten teachers are as follows:
35; 41; 23; 42; 42; 53; 47; 42; 23; 29

5.1 Determine the mode:

5.2 Determine the median:
5.3 Determine the arithmetical average:

6. What “formula” is used to determine possibility?

7. What is the probability that I will take a green ball out of a basket with 7 green, 6 red, and 4 yellow balls?

7.2 What is the probability that I will take a yellow Smartie from a container with 5 green, 9 blue, 7 yellow, 2 pink and 4 red Smarties?

4.24.7.1 Assessment

**Learning Outcome 1:** The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

**Assessment Standard 1.9:** We know this when the learner performs mental calculations.
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Module: "To calculate by selecting appropriate operations for solving problems"
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Pages: 31-38
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Module: "To perform mental calculations"
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Module: "To calculate by selecting operations appropriate to solving problems"
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Module: "To recognise and use the properties of addition"
By: Siyavula Uploaders
URL: http://cnx.org/content/m20048/1.1/
Pages: 42-43
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Module: "To perform mental calculations"
By: Siyavula Uploaders
URL: http://cnx.org/content/m20072/1.1/
Pages: 64-65
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Module: "To describe and illustrate number systems that differ from our own"
By: Siyavula Uploaders
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Module: "To determine the equivalence and validity of different methods"
By: Siyavula Uploaders
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Pages: 69-70
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Module: "To calculate by choosing methods that are appropriate for solving problem"
By: Siyavula Uploaders
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Pages: 70-71
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Module: "To perform mental calculations"
By: Siyavula Uploaders
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Pages: 72-73
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Module: "To solve problems in context"
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Module: "To solve problems in context"
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Pages: 76-78
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Module: "To perform mental calculations"
By: Siyavula Uploaders
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Pages: 79-80
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Module: "To recognise, classify and represent numbers"
By: Siyavula Uploaders
URL: http://cnx.org/content/m20930/1.1/
Pages: 80-82
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Module: "To recognise, describe and use the properties of whole numbers"
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URL: http://cnx.org/content/m20932/1.1/
Pages: 82-84
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Module: "To perform mental calculations"
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Module: "To determine output values for given input values"
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Module: "To use a range of techniques to perform calculations"
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Module: "To use a range of techniques to perform calculations"
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Pages: 91-95
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Module: "To perform mental calculations"
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Pages: 95-96
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Module: "To solve problems in context"
By: Siyavula Uploaders
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Pages: 96-97
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Module: "To calculate with the help of selected operations appropriate to solving the problem"
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Pages: 98-100
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Module: "To calculate with the use of selected operations that are appropriate for solving the problem"
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Module: "To perform mental calculations"
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Module: "To recognise, describe and use"
By: Siyavula Uploaders
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Module: "To use divisibility rules"
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Pages: 109-111
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Module: "To use a range of techniques for performing calculations"
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URL: http://cnx.org/content/m31925/1.1/
Pages: 112-114
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Module: "To recognise and classify numbers in order to describe and compare them"
By: Siyavula Uploaders
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Pages: 127-131
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Module: "To calculate by selecting operations appropriate for solving problems"
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Pages: 132-135
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Module: "To recognise and classify numbers in order to describe and compare them"
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Module: "To perform mental calculations"
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URL: http://cnx.org/content/m30961/1.1/
Pages: 140-142
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Module: "To recognise equivalent forms of numbers To recognise equivalent forms of numbers"
By: Siyavula Uploaders
URL: http://cnx.org/content/m30962/1.1/
Pages: 143-145
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Module: "ACTIVITY: To calculate by selecting operations appropriate to solving problems"
By: Siyavula Uploaders
URL: http://cnx.org/content/m30963/1.1/
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Module: "ACTIVITY: To calculate by selecting operations appropriate to solving problems"
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Pages: 147-149
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Module: "To calculate by selecting operations appropriate to solving problems"
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Module: "To solve problems in context"
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Module: "To perform mental calculations"
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Module: "To calculate by selecting operations appropriate to solving problems"
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Module: "To perform mental calculations"
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Module: "To calculate by selecting operations appropriate to solving problems"
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Module: "To use a range of strategies to check solutions"
By: Siyavula Uploaders
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Pages: 163-164
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Module: "To find fractions of whole numbers"
By: Siyavula Uploaders
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Module: "To find fractions of whole numbers"
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Module: "To record data"
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Pages: 170-172
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Module: "Test"
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URL: http://cnx.org/content/m30990/1.1/
Pages: 172-174
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Module: "To recognise the place values of digits"
By: Siyavula Uploaders
URL: http://cnx.org/content/m30995/1.1/
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Module: "To recognise and classify numbers in order to describe and compare them"
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Module: "To use a range of techniques to perform calculations"
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Module: "To recognise and classify numbers in order to describe and compare them"
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Module: "To recognise and classify numbers in order to describe and compare them"
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Pages: 182-184
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Module: "To perform mental calculations"
By: Siyavula Uploaders
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Pages: 184-186
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Module: "To perform mental calculations"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31042/1.1/
Pages: 206-207
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Module: "To describe observed rules in your own words"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31043/1.1/
Pages: 208-211
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Module: "To describe observed rules in your own words"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31045/1.1/
Pages: 211-214
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Module: "To use a range of techniques to perform calculations"
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URL: http://cnx.org/content/m31210/1.1/
Pages: 215-217
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Module: "To resolve problems in context"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31213/1.1/
Pages: 217-219
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Module: "Test"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31214/1.1/
Pages: 219-221
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Module: "To measure and calculate a perimeter"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21019/1.1/
Pages: 223-226
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Module: "To perform mental calculations"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21020/1.1/
Pages: 226-227
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Module: "To estimate, measure and record 2-dimensional shapes and 3-dimensional objects"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21021/1.1/
Pages: 228-229
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Module: "To solve problems involving converting between units"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21022/1.1/
Pages: 230-231
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Module: "To solve problems in context"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21026/1.1/
Pages: 231-234
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Module: "To solve problems in context"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21028/1.1/
Pages: 234-237
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Module: "To investigate how to determine area"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21029/1.1/
Pages: 237-239
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Module: "To calculate area"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21032/1.1/
Pages: 239-240
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Module: "To calculate area by investigating and estimating"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21034/1.1/
Pages: 241-242
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Module: "To solve problems in context"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21041/1.1/
Pages: 242-244
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Module: "To estimate, measure and record the mass of 2-dimensional shapes and to use appropriate measuring instruments"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21111/1.1/
Page: 245
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Module: "To calculate by selecting appropriate operations for solving particular problems"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21079/1.1/
Pages: 246-247
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Module: "To use appropriate measuring instruments"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21080/1.1/
Pages: 248-249
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Module: "To calculate by selecting appropriate operations for solving particular problems"
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URL: http://cnx.org/content/m21081/1.1/
Pages: 249-250
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Module: "Performing mental calculations"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21082/1.1/
Pages: 250-251
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Module: "To multiply with decimals"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21083/1.1/
Pages: 251-253
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Module: "To solve problems that include converting between S.I. units"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21084/1.1/
Pages: 253-254
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Module: "To solve problems involving operations and conversion of time units"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21098/1.1/
Pages: 268-269
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Module: "To solve problems involving time units"
By: Siyavula Uploaders
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Pages: 270-272
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Module: "To record temperature using degrees Celsius"
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Pages: 272-281
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Module: "Recognising and describing angles"
By: Siyavula Uploaders
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Module: "Recognising and describing angles"
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Pages: 287-288
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Module: "To recognise and describe angles"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21121/1.1/
Pages: 288-291
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Module: "To recognise and name 2-dimensional figures"
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Pages: 291-293
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Module: "To describe 2-dimensional figures in terms of different properties"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31671/1.1/
Pages: 293-294
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Module: "To use the vocabulary and properties of rotations to describe the relationships between 2-D shapes"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21125/1.1/
Pages: 294-296
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Module: "To draw enlargements and reductions of 2-dimensional figures"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31673/1.1/
Pages: 296-298
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Module: "To investigate and compare 2-dimensional figures"
By: Siyavula Uploaders
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Pages: 298-304
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Module: "To describe and classify 3-dimensional figures"
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Module: "To recognise, visualise and name 3-dimensional figures"
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Pages: 306-307
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Module: "To investigate and compare 3-dimensional figures"
By: Siyavula Uploaders
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Page: 308
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Module: "To draw and interpret sketches"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31683/1.1/
Pages: 309-311
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Module: "To find specific positions and explaining how to move between positions"
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Pages: 311-312
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Module: "To do mental calculations"
By: Siyavula Uploaders
URL: http://cnx.org/content/m21144/1.1/
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Module: "To use simple tables to collect data and answer questions"
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Module: "To ask simple questions and identify sources of data"
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Pages: 315-316
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Module: "To draw a number of different graphs"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31678/1.1/
Pages: 316-319
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Module: "To read and interpret data critically"
By: Siyavula Uploaders
URL: http://cnx.org/content/m31679/1.1/
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Module: "To examine ungrouped numerical data to determine the mode and the median"
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