

LEARNING AREA **MATHEMATICS**

MATHEMATICS GRADE _____

AND

MATHEMATICS GRADE _____

AND

MATHEMATICS GRADE _____

AND

MATHEMATICS GRADE _____

4

5

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TEACHER'S GUIDE

MODULE 1



OVERVIEW MODULE 1

CONTENTS	
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INTRODUCTION

The understanding and use of mathematics is a **life skill**. Mathematics enables members of society to function as **useful, integral parts of society**.

In teaching mathematics we aim to make the learner see how mathematical relationships are used in all the aspects of everyday life; develop in the learner a confidence and competence and lack of fear when coping with mathematical situations; help the learner to be aware of the beauty and elegance of mathematics; and develop in the learner a questioning attitude and a love of mathematics.

INTERMEDIATE PHASE OVERVIEW

The Mathematics Learning Area includes interrelated knowledge and skills:

Knowledge	Skills
Numbers, operations and relationships	Representation and interpretation
Patterns, functions and algebra	Estimation and calculation
Space and shape (geometry)	Reasoning and communication
Measurement	Problem posing
Data handling	Problem solving and investigation
	Describing and analysing

The knowledge and skills are reflected in the Learning Outcomes, as indicated in the table below.

	Learning Outcomes	Main focus in each outcome
LO1	Numbers, operations and relationships To be able to recognize, describe and represent numbers and their relationships and to count, estimate, calculate and check with competence and confidence in solving problems	The learner moves from counting correctly to calculating with all four operations; learns to use the calculator as an effective tool as and when it's needed; knows tables to 12 x 12 and can calculate mentally effectively.
LO 2	Patterns, functions and algebra To be able to recognize, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills	Numeric and geometric patterns are studied, especially the relationships between the terms in a sequence and between the number of a term and the term itself.
LO 3	Space and Shape (Geometry) To be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional shapes in a variety of orientations and positions	The learner deals with a more detailed description of 2D shapes and 3D objects.
LO 4	Measurement To be able to use appropriate measuring units, instruments and formulae in a variety of contexts	Learners use standardized units of measurement and measuring instruments and must be able to estimate and prove results through accurate measurement.
LO 5	Data handling To be able to collect, summarize, display and critically analyse data in order to draw conclusions and make predictions, and to determine chance variation	Learners gain skills in gathering and summarising data so that the data can be interpreted and used to make predictions.

ASSESSMENT STANDARDS

The assessment standards are closely related. Activities should, wherever possible, cover *more than one* assessment standard within one learning outcome. Activities may cover related Assessment Standards across Learning Outcomes within the grade.

LEARNER ASSESSMENT

At the end of each activity there is an assessment sheet. Both the learner and the educator complete this. The assessment of both may then be compared. The educator's assessment will serve to provide marks for the portfolio.

CODES FOR ASSESSMENT SHEETS

4 = Learner's performance *has exceeded* the requirements of the learning outcome for the grade.

3 = Learner's performance **has satisfied** the requirements of the learning outcome for the grade.

2 = Learner's performance **has partially satisfied** the requirements of the learning outcome for the grade.

1 = Learner's performance **has not satisfied** the requirements of the learning outcome for the grade.

CONTINUOUS ASSESSMENT: LEARNER'S PORTFOLIO

Each learner will have a portfolio. A portfolio is "a method of assessment that gives the learner and teacher together an opportunity to consider work done for a number of assessment activities" (Rev. Nat. Curriculum, May 2002, p. 99). A learner's portfolio gives a full picture of his/her achievements concerning knowledge, skills, attitudes and values.

To be effective, continuous assessment should include various forms of assessment. For moderation purposes, proof of the following assessed activities must be kept and may be placed in the portfolio, which should include the following*:

Forms of assessment	Minimum requirements	Year
Tests/Examinations	2 per term for the first 3 terms	6 per year
Class work/Homework	2 per term	8 per year
Projects (in a group)	1 before the end of the second term	1
Tasks (individual)	1 per semester / 2 per year	2
Investigations	1 per semester / 2 per year	2
Total number of items enclosed in the portfolio for moderation purposes		19

*(This is for the Senior Phase, grade 7 - 9 and is also to be applied to grade 4.)

The link between outcomes and forms of assessment

The aim of Outcomes-Based Education is to enable learners to realise their potential. This is done by setting learning outcomes (goals). These learning outcomes are explained to the learners before they begin each activity. To help them to achieve the learning outcomes there are detailed minimum Assessment Standards. Thus the approach is learner-centred and activity-based.

Each module comprises a variety of tasks, the required number of assignments, projects, tests, investigations and class work. In completing these adequately, the learner will fulfil the minimum Assessment Standards; in achieving the minimum assessment Standards, the learner will achieve the desired learning outcome and also the critical outcomes (life skills) and developmental outcomes (what the learners must be able to use to acquire life skills).

The activities in the modules are designed to relate to “real life” situations and problems in everyday life. There are activities to create an awareness of the relationship between social justice, human rights, a healthy environment and inclusively. Learners are also encouraged to develop knowledge and understanding of the rich diversity of this country, including the cultural, religious and ethnic components of this diversity.

LEARNING PROGRAMME OVERVIEW

“Education is to be learner-centred and activity-based” (Revised National Curriculum Statement – May 2002).

Module 1 By completing this module the learner will gain skills concerning whole numbers; extend his/ her number range; improve and refine methods of calculation according to his/ her stage of development, and discover how numbers are used in everyday life.

Time Schedule

Each of the four modules should take approximately ten weeks. A detailed time schedule is presented below: NOTE: this is merely a **suggested** schedule.

MODULE	ACTIVITY	CONTENTS	TIME (an approximation)
ONE	1	Counting forwards and backwards to 10 000; using the calculator (mainly as a learning tool); mental calculations: adding and subtracting; word sums and problem solving.	1 week initially; Then daily all year
	2	Place value (<i>very important</i>)	1 week initially
	3	Word sums and problems, comparing two or more quantities of the same kind; Rounding off; adding and subtracting; written work; techniques; strategies for checking solutions	2 weeks, with discussion
	4	Problems; a budget; money; buying and selling; human rights, social, economic and environmental issues	Project: 1 week The rest: 1 week
	5	Recognizing and representing numbers; making numbers; larger than/smaller than; even and odd numbers; number lines; ascending and descending order; mental calculations; more and less	2 weeks
	6	Multiples of single-digit numbers to 100 Doubling and halving	2 weeks, initially then all year
	7	History of numbers	Assignment: 1 week Other work: 1 week

Approach

Seeing that education is to be learner-centred and activity-based

Discussion

Amongst the learners after and even during an activity is very important. It *must take place*, as it is *through discussion that the learner clarifies his/her thoughts*. The teacher has the exciting and difficult task of initiating discussion, controlling it but NOT dominating it.

The use of **calculators** is to be integrated in the activities where necessary.

4. STEP BY STEP THROUGH THE ACTIVITIES

The teacher should begin with Module 1, activity 1 and work through each activity up to the last activity of module 4. Having said this, oral activities (e.g. the examples in activity 1 and in other activities) should be done daily, for 5 minutes each day from the beginning of the year to the end of the year, and should be varied so that learners are kept on their toes. Speed tests cannot be used to replace oral activities, as their aims are totally different and opposing to those of oral activities.

4.1 MODULE 1

..... **ACTIVITY 1.1: Counting forwards and backwards in 2s; 3s; 5s; 10s; 25s; 50s and 100s.**

- ▶ WHAT SHOULD I DO IF I FIND SOME/ALL OF MY LEARNERS CANNOT COUNT?
- ▶ If learners have been through the Foundation Phase and still cannot cope with 1.1 it is suggested that extra oral work on the mat is needed. Try letting each learner hold a tape measure and count, while moving their fingers to the correct number. They can learn to count to 150 with a tape measure, forwards and backwards.
- ▶ Or let them learn with a calculator. As you know they can't count, let each learner *press the button first and see the number, and then say it*. Instead of counting in 2s etc. they program their calculator to count in 1s.

To program the calculator:

Sharp EL 231: 1+ = = =; Casio: 1 + + = = =

Let them *count on* from a number too, e.g. count on from 51 to 91.

Sharp E. 231: 51 + 1 = = =; Casio 1 + + 51 = = = be careful to do it like this. (If you press 51 + + 1 = = = see what happens on a Casio – it keeps adding the 51! It always keeps adding the first number you put in. This is why it is important for learners to know their calculators.)

- ▶ There are some excellent books for the Foundation Phase if more counting exercises are needed.
- ▶ Note: It is quite normal for learners in one class to be at different stages of development concerning real understanding of numbers. A learner may be able to count using large numbers, and yet have no real understanding of their meaning. The teacher can use the exercises in activity 1 for all the learners, adapting the starting and ending numbers to

Suite each learner. It is very important that each learner should work with numbers that he/she understands, and not be forced to use numbers that are too large and which have no real meaning for him/ her. Understanding must grow. Give it time. Also do daily oral work “up and down the Number Line” with those who need it. Start with a number, e.g. 54 and ask learners to add 1-digit numbers or subtract them, e.g. $54 + 4 = \dots$. Add 1-digit numbers to the answer each time.

ORAL GROUP WORK

- ▶ Appoint one learner in each group (or pair) to hold the calculator and be the “Control”. This learner programmes the calculator to count as required. He/ she presses the = sign each time the others say a multiple and checks their answers. If they make an error, the “control” says “Stop” and shows them the correct answer. Counting then *continues*. Learners accept correction from a calculator more comfortably than from an adult. It is not a “big issue”. Change the “Control” often so that each learner gets plenty of opportunity to count without a calculator. It is a good idea to let “weak” learners hold the calculator. They feel important telling *others* when *they* are wrong, and gain confidence, but make sure that they also count without the calculator and don’t become lazy! If you have any “live wires” (hyper-active learners) it may be good for them to have something in their hands – their attention will also be focused.
- ▶ Let your groups count while you walk round and listen, or ask various learners to continue: “Susan, you begin” then, “Peter, you continue” and “Mary, count backwards from” etc. This keeps the learners on their toes. If they are struggling, let the whole group count softly together. This gives them confidence.

..... ACTIVITY 1.2 place value

- ▶ This is an extremely important concept. The activities are straightforward. Calculator games can be a very powerful learning tool. Instead of drilling using boring columns which learners never seem to understand, try telling them to key into a calculator any number, example 2 345. Ask them to tell you how to get rid of the 3 with one command. They say, “Key in – 300 =”. Someone may say “Key in + 700 =” Allow them to discuss if this is correct. (It is!) Play this game often – it’s a fun way of learning place value.
- ▶ Another calculator game is: “I have 87. How can I make it into 870?” They will say, “Key in x 10 =”

.....ACTIVITY 3

ROUNDING OFF

- ▶ This section can be followed step by step in the learner’s module. Point out the practical uses of rounding off. It can be used as a quick an easy method to estimate, more or less, an amount and this is often useful in the “real world”. It can also be used to check answers and see that they are reasonable.

WORD SUMS

- ▶ Comparing two or more quantities; Learners may become confused. Make sure they understand the problem i.e. what information they must supply. Do not tell them how to find it! Show them that you have confidence in their ability to solve the problem, that you will give them a reasonable amount of time to do so, and that you are very (genuinely) interested in how each of them decides to solve the problem.

- ▶ Allow them to discuss their answers with a friend, and they will also naturally discuss their methods if they differ in opinion. Thus they will be communicating their ideas naturally, because *they need to convince the friend that they are right*, and not in an artificial, stressed way as when they are told to “prepare an ‘oral’ about...”
- ▶ Problem-solving thus consists of three difficult and important parts:
 - getting an answer
 - communicating logical thoughts orally, step by step and
 - communicating logical thoughts in writing, clearly and neatly so that others may follow and use the method
- ▶ Learners find this task not very easy, but they can cope, given time, encouragement and interest in what they propose to do. Your task as educator is to provide these, and to make sure that they understand the words, the situation and the question.

CALCULATOR GAME

- ▶ If there is stress, it is positive stress, not negative stress. The confidence, interest and will to try is often annihilated by a speed test. A weak learner may get poorer and poorer marks with each successive speed test, whereas with this game a weak learner will try in order to beat a friend, and it is oral; faults may be corrected and the game continued.

TECHNIQUES

- ▶ Learners prefer to use their own techniques. Please do not destroy their self-confidence and interest by forcing on them algorithms which they may not understand.

WRITTEN EXERCISE

- ▶ This short exercise serves to highlight some common errors. Discussion after its completion is valuable.

WRITTEN EXERCISE

- ▶ This stresses methods for addition and subtraction.
- ▶ N.B. Methods are not imposed on the learners. They are allowed to use the method, which they prefer, and thus remain confident. Growth and improvement of methods comes with the discussion after the sums have been done.
- ▶ The learner commits him-/herself by writing down his/her method. Then he/she discusses it with a friend, explaining what he/she did (the explaining is important as it serves to clarify and consolidate the method in the learner’s own mind) and he/she also sees other methods used by friends.
- ▶ You may wish to ask 5 learners, each with different methods, to write their steps on the board, so that there can be a class discussion. In this way learners may be exposed to more sophisticated methods, but do not force them to use them if they do not wish to; more haste, less speed; let them develop in their own time. If you do this, you will not destroy their self-confidence and understanding. It is very important. Too many educators try to impose sophisticated methods on learners who are not ready for them with the result that in Grades 6 and 7 (if not before) they find grave problems with methods which they do not understand (the “little numbers at the top” –borrowing and carrying). It is very difficult and time-consuming to correct these problems.

CRAFT MARKET

- ▶ Again this is a comparing exercise with lots of numbers. It is quite straightforward but many calculations are needed. If learners try to estimate, by rounding off, praise them and see if the method is accurate enough to provide a correct answer. Then they fill in the assessment sheet; the educator gives his/her assessment and the two may be compared.

.....**ACTIVITY 4**

- ▶ This ACTIVITY is basically about money, buying and selling, word sums concerning money, human rights, social justice and environmental affairs. Learners have to pick out relevant amounts in a list. The question about the environment poses practical problems of pollution, which could lead to a useful discussion. There is also a budget, Grade 4 level; a practical exercise which they could enjoy. Human rights and social justice questions are included in a practical way at Grade 4 level. The Budget is quite advanced and you may have to guide them.

.....**ACTIVITY 5**

- ▶ There are explicit instructions in the module. You will have to make books available and give guidance.
- ▶ Speed Tests
- ▶ There are 4 at the end of the module for those educators who still use them. They can be given at regular intervals.

MEMORANDUM GRADE 4 MODULE 1

..... ACTIVITY 1

1. COUNTING IN THE EVERYDAY WORLD

594; 596; 598; 600; 602
985; 990; 995; 1 000; 1 005
670; 680; 690; 700; 710
750; 775; 800; 825; 850
800; 850; 900; 950; 1 000; 1 050
700; 800; 900; 1 000; 1 100
1 402 km

2. COUNTING WITH A CALCULATOR

3. COUNTING FORWARDS AND BACKWARDS

- 3.1 186; 188; 190; 192; 194; 196; 198; 200; 202; 204
206; 204; 202; 200; 198; 196; 194;
- 3.2 0; 3; 6; 9; 12; 15; 18; 21; 24; 27; 30; 33; 36
36; 33; 30; 27; 24; 21; 18; 15; 12; 9; 6; 3; 0
- 3.3 375; 380; 385; 390; 395; 400; 405; 410; 415; 420; 425
545; 540; 535; 530; 525; 520; 515; 510; 505; 500; 495; 490; 485;
- 3.4 950; 960; 970; 980; 990; 1 000; 1 010; 1 020
950; 940; 930; 920; 910; 900; 890; 880; 870; 860; 850; 840
- 3.5 625; 650; 675; 700; 725; 750; 775; 800; 825; 850; 875 900; 925; 950; 975; 1 000
975; 950; 925; 900; 875; 850; 825; 700; 775; 750; 725; 600; 675
- 3.6 500; 550; 600; 650; 700; 750; 800; 850; 900; 950;
1 000; 1 050
750; 700; 650; 600; 550; 500; 450; 400; 350
- 3.7 400; 500; 600; 700; 800; 900; 1 000; 1 100
1 000; 900; 800; 700; 600; 500; 400; 300; 200; 100; 0

4. COUNTING: (practice)

5. COUNTING WITH LARGER NUMBERS (Oral individual work; control with a calculator if necessary.)

- 5.9 980; 9 982; 9 984; 9 986; 9 988; 9 990; 9 992; 9 994; 9 996; 9 998; 10 000
5 010; 5 008; 5 006; 5 004; 5 002; 5 000; 4 998; 4 996; 4 994; 4 992; 4 990

5.2 8 982; 8 985; 8 988; 8 991; 8 994; 8 997

5.2 (cont.) 1 836; 1 833; 1830; ... 1 800

5.3 4 870; 4 875; 4 880; ... 5 015
9 125; 9 120; 9115; ... 8 980

5.4 8 960; 8 970; 8 980; ... 9 020
5 100; 5 090; 5080; ... 4 980

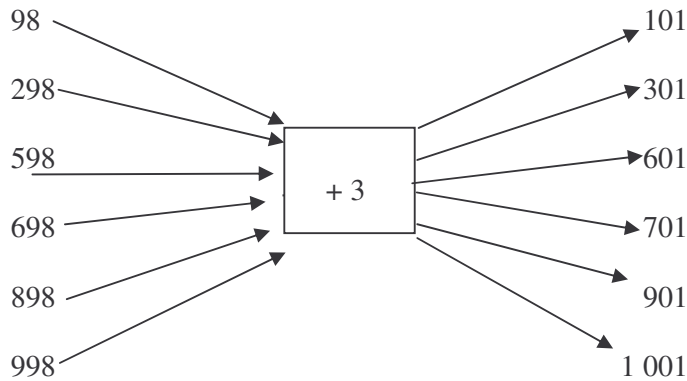
5.5 7 625; 7650; 7675; ... 7 750
10 000; 9 975; 9 950; ... 9 870

5.6 8 250; 8 300; 8 350; ... 8 500
9 750; 9 700; 9 650; ... 9 500

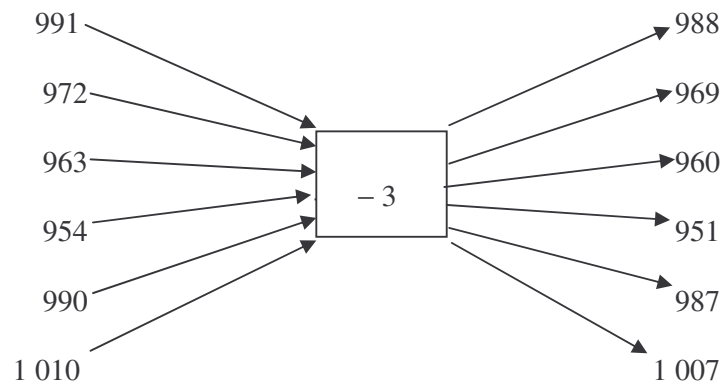
5.7 5 400; 5 500; 5 600; ... 6 000
7 000; 6 900; 6 800; ... 6 000

6. FLOW DIAGRAMS

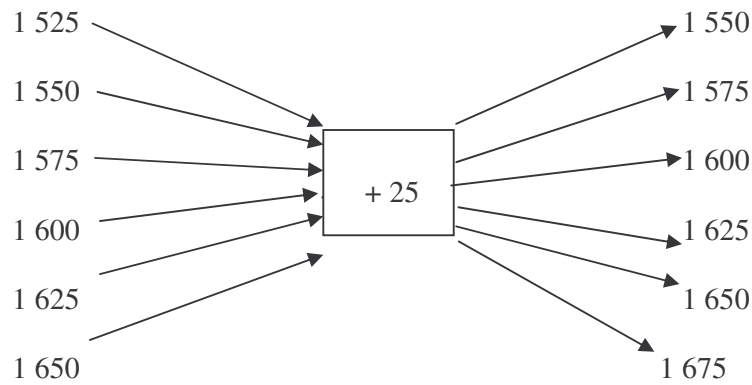
6.1



6.2



7.



8. MORE LARGE NUMBERS

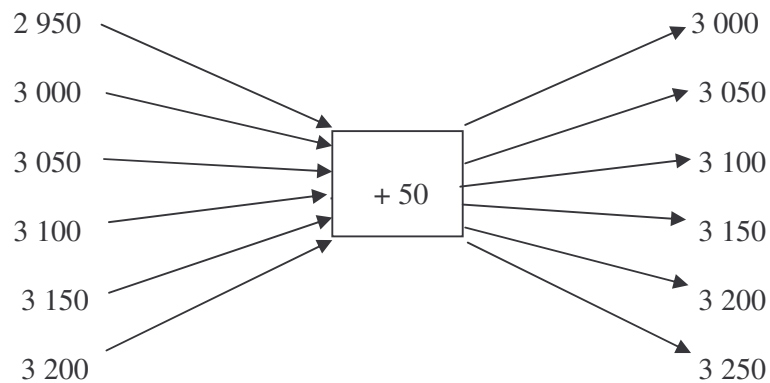
8.1 9 994; 9 992; 9 990; 9 988

8.2 1 980; 1 990; 2 000; 2 010

8.3 9 850; 9950; 10 050; 10 150

8.4 8 810; 8 805; 8 800; 8 795

9. LARGER NUMBERS IN A FLOW DIAGRAM



10 COUNTING IN INTERVALS OF FOUR

The only numbers *not* encircled are:

1 998

9 998

9 545

8 894

8 898

..... **ACTIVITY 2 PLACE VALUE**

1. $1\ 000 + 100 + 10 + 1$
2. $1\ 000 + 300 + 20 + 6 = 1\ 326$

3. $7\ 834 = 7\ 000 + 800 + 30 + 4$
 $2\ 056 = 2\ 000 + 0 + 50 + 6$
 $8\ 503 = 8\ 000 + 500 + 0 + 3$
 $1\ 940 = 1\ 000 + 900 + 400 + 0$
 $16\ 473 = 10\ 000 + 6\ 000 + 400 + 70 + 3$
 $25\ 809 = 20\ 000 + 5\ 000 + 800 + 0 + 9$

4. Note: using 2; 8; 4; 1 there can be many numbers; room has been given for 4 numbers only, so all

THOUSANDS	HUNDREDS	TENS	UNITS
1 000	100	10	1
2	8	4	1
2	4	8	1
2	1	8	4
2	8	1	4
2	4	1	8
2	1	4	8
8	4	2	1
8	4	1	2
8	2	4	1
8	2	1	4
8	1	2	4
8	1	4	2
4	8	2	1
4	8	1	2
4	2	8	1
4	2	1	8
4	1	8	2
4	1	2	8
1	8	2	4
1	8	4	2
1	4	8	2
1	4	2	8
1	2	8	4
1	2	4	8

Possibly not all learners will notice that there could be all these numbers, but some learners are sure to do so. This could start valuable discussion. The largest possible number is 8 421. The smallest is 1 248.

- 4.1 Again only 4 steps have been provided. Check that their answers are in descending order, e.g. 8 421; 4 821; 2 841; 1 248

Note: it is not necessary for the learners to put all the possible numbers into descending order; four numbers are sufficient to show that they understand the meaning of descending order.

- 4.2 Again, four numbers are sufficient to show that the learner understands the meaning of ascending order. Please check each learner's answers.

E.g.: 1 248; 2 148; 4 218; 8 421

- 4.3 5 069; 6 059; 6 095; 9 065; 9 506

- 4.4 8 513; 8 315; 5 318; 3 851; 1 853

- 5.2 1; 3; 5; 7; 9; 11; 13; 15

TEST YOUR KNOWLEDGE: odd and even numbers

1. 2 802; 2 894; 2 806; 2 808; 2 810
2. 9 999
3. 3 000

6. LARGER AND SMALLER > ; < ; =

- 6.1 (a) < (b) = c) > (d) <

- 6.2 1 480

7.

Number	Operator	Answer
58	X 100	5 800
145	X 10	1 450
309	X 10	3 090
20	÷ 10	2
1 000	X 10	10 000
520	÷ 10	52
1 690	÷ 10	169
1 000	÷ 100	10
10 000	÷ 10	1 000

9. 3 000; 8 000
20; 10 000

10.

7 374	$7\ 000 - 70 = 6\ 930$
6 995	$9\ 00 - 90 = 810$
3 023	$3\ 000 - 3 = 2\ 997$
5 519	$5\ 000 - 500 = 4\ 500$
2 454	$400 - 4 = 396$
10 010	$10\ 000 - 10 = 9\ 990$

11. Game

12. The first two are examples:

Number, bold digit to be replaced by 0	What to do	Calculator answer			
1 356	- 6 or: + 4	1 350 1 360			
2 519	- 200	2 319		×	- 2 000 =
6 723	- 700 or: + 300	6 023 7 023			
15 638	- 30 or: + 70	15 608 15 708			
13 642	-10 000 or: + 90 000	3 642 103 642			
17 389	- 7 000 or: + 3 000	10 389 20 389			
5 90	- 500 or: + 500	90 1 090			
14 843	- 3 or: + 7	14 840 14 850			
7 394	- 300 or: + 700	7 094 8 094			

13. Yes

TEST YOUR SKILLS: PLACE VALUE

1. 6 029

2.1 97 620

2.2 4 519

2.3 3 010

3. 6 000

4. - 7 000 of + 3 000

- 5.1 9 999 5.2 1 001
 5.3 999 5.4 5 010
- 6.1 300
 6.2 310
 6.3 200
 6.4 190
 6.5 210

TESTING YOUR PROGRESS SO FAR

Decimal
 0; 1; 2; 3; 4; ... 9
 400
 (a) 8 000 (b) 8
 1 848
 18 412
 $1 \times 10\,000 + 8 \times 1\,000 + 4 \times 100 + 0 + 8$
 18 410; 18 412; 18414; 18 416; 18 418

2. 18 808; 18 908; 19 008

.....**ACTIVITY 3**

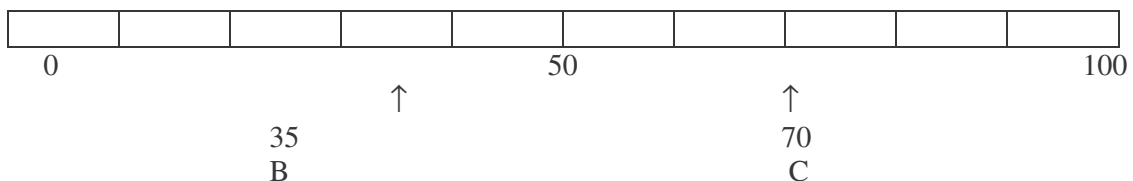
- 1.1 home 1.2 friend's home 1.3 either / friend's home
 1.4 50; 1 350; 280; 980; 250; 1 130; 680

1.5

Sum	Numbers rounded off to nearest 10	Approximate answer	Exact answer	Difference
24 + 36	20 + 40	60	60	0
52 + 48	50 + 50	100	100	0
33 + 52	30 + 50	80	85	5
79 + 23	80 + 20	100	102	2
17 + 47	20 + 50	70	64	6
125 + 46	130 + 50	180	171	9
411 + 732	410 + 730	1 140	1 143	3

- 1.6 They are close when one number is rounded off upwards and the other, downwards. When both numbers are rounded off upwards, or both are rounded off downwards the totals are not very close, e.g. the third sum; the fifth sum and the last two sums. The rounding off increases the gap.

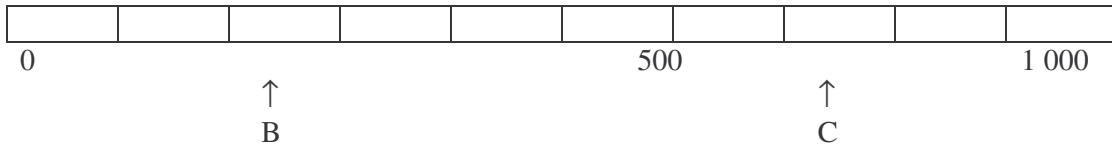
- 1.7
 (a) 10 (b) 0 (c) 100



1.8 300; 300; 500; 1 200; 1 400

1.9

(a) 100 (b) 0 (c) 1 000



1.10 1 000; 2 000; 4 000; 1 000; 1 000; 0

1.11 $873 + 46 = 919$; $870 + 50 = 920$
 $934 - 87 = 847$; $930 - 90 = 840$

2 WORD SUMS

2.1 $642 - 493 = 149$; $640 - 490 = 150$

The boys were behind by 149 points.

2.2 (a) Yes

(b) $734 - 655 = 79$; $730 - 660 = 70$

At tea-time the difference between the Girls' points and the boys' was 149 points; at lunch-time the difference was only 79 points, so the boys were catching up.

(c) 79 points, see above

(d) Girls: $734 + 519 = 1\,253$ Boys: $655 + 619 = 1\,274$

The boys won by 21 points.

3.1 Calculator Game

3.2 (a) 93 (b) 993 (c) 493 (d) 483 (e) 473 (f) 630
(g) 930 (h) 2 030

4.1 and 4.2 Discussion: Techniques

4.3 (a) 15 (b) 25 (c) 25 (d) 35 (e) 1 (f) 11
(g) 21 (h) 11

5. GESKREWE SOMME

5.1 33 5.2 27

5.3 and 5.4 discussion and explanation

6.1 1623 6.2 733 6.3 2 411 6.4 173

6.5 25 6.6 7 306

6.7 Checking by rounding off and discussion

7.1 9 873 cool drinks

7.2 Cool drinks; 620 more cool drinks were sold than ice-creams

7.3 44 ice-creams were over

- 7.4 Hot dogs
- 7.5 May; many hot-dogs and mugs of soup were sold; few cool drinks and ice creams were sold.
- 7.6 6 000 cups of soup

.....**ACTIVITY 4**

1. MONEY MATTERS

- 1.1.1 500 cent 1.2 5 000 cent 1.3 20 five-cent pieces
- 1.4 200 five-cent pieces
- 1.5 2 000 five-cent pieces 1.6 10 ten-cent pieces 1.7 1 000 ten-cent pieces
- 1.8 2 fifty-cent pieces 1.9 20 fifty-cent pieces 1.10 40 fifty-cent pieces

2. SHOPPING FOR STATIONERY

- 2.1(a) R20 (b) R63 (c) R18 (d) R33 (e) R39
- 2.2 R173

3.1 It saves time; yes.

3.2

Notes And Coins	R78,76	Amounts R30,45	of change R43,62	to be R21,94	R120,13	R0,55
R100					1	
R50	1					
R20	1	1	2	1	1	
R10		1				
R5	1					
R2	1		1			
R1	1		1	1		
50c	1		1	1		1
20c	1	2		2		
10c	1		1		1	
5c		1	1	1	1	1

3.3 Remember, change is rounded off *upwards*, so if the *change to be given* is R78,76, the customer is given R78,80

4. AT SCHOOL

- 4.1 15
- 4.2 (a) 21 (b) 3 (c) Cricket fields 1 and 1 en 3 (d) cricket field 2
- (f) 9
- (g) 141 (h) own opinion (j) own answer (k) own answer

5. BUDGETS

5.1 GROUP WORK – AN INVESTIGATION - own answers

- 5.2 (a) own answer (b) own answer (c) own answer (d) own answer

TEST YOUR PROGRESS

1. Rounding off to the nearest:

	10	100	1 000
1 387	1 390	1 400	1 000
925	930	900	1 000
4 813	4 810	4 800	5 000
6 492	6 490	6 500	6 000
9 509	9 510	9 500	10 000

2.1 10 400

2.2 3 900

3.1 5 000

3.2 1 000

4.1 9 661

4.2 2 824

4.3 2 898

5 WITH CALCULATORS – WORD SUMS

5.1 17 More

5.2 Yes; 910 – 909

5.3 Mr. Gouws

5.4 2 090

..... ACTIVITY 5 – WAYS OF COUNTING

1. NUMBER NAMES

1.1 ICS to supply numbers 1 to 10 inclusive in eleven official languages.

1.2 Oral group work

1.3 ICS to provide numbers 11 to 20 inclusive in eleven official languages.

1.4 ICS to provide numbers: 100; 1 000 and 10 000 in eleven official languages.

ASSIGNMENT

2.1 They had to count their animals and possessions.

2.2 Drawing

2.3 They put a stone in a bag for each animal or possession.

3. Babylonians

3.1 Drawing

3.2 cuneiform writing

4.1 one; double one; three

4.2 XI; XII; XIII; XIV; XV; XVI; XVII; XVIII; XIX; XX

4.3 100

4.4 1 000

5. The Ancient Egyptians

5.1 I 5.2 see diagram

5.3 see diagram

6 The Hindu-Arabic symbols

Discussion

End of Module 1

OUTLINE MATHEMATICS GRADE 5

MODULE 1: NUMBER CONCEPT

There are five modules in the learning programme:

1. Number Sense, Addition and Subtraction
2. Multiplication and Division
3. Fractions and Decimal Fractions
4. Measurement
5. Geometry and Data Handling

It is important that teachers deal with the modules in the above-mentioned order, because the learners need the knowledge and skills attained in each module to continue with the next one.

NUMBER SENSE, ADDITION AND SUBTRACTION (LO 1 AND LO 2)

LEARNING UNIT 1 FOCUS ON:

- ▶ Knowledge of the difference between even and uneven numbers
- ▶ Writing numbers in extended notation
- ▶ Comparing and arranging numbers
- ▶ Extending the learner's number sense to 10 000
- ▶ The ability to round off to the nearest 100 and 1 000
- ▶ Revision of the learner's knowledge of multiples, factors and prime numbers

The module lends itself well to Critical Outcomes 2 (Learners work effectively with others as members of a team, group, organisation and community) and 5 (Learners communicate effectively using visual, symbolic and/or language skills in various modes).

Seeing that it is the first learning unit of the year, it will probably take 4 - 5 weeks to complete.

IN LEARNING UNIT 2 FOCUSES ON:

- ▶ Adding with larger numbers
- ▶ Pocket calculator skills
- ▶ Here the emphasis can be placed on different methods/strategies of addition. Encourage learners to use their own methods, but move towards the vertical method of addition. At the end of Gr. 5 all the learners should be able to add in this way. Also note the correct terminology: sum of; inversion.
- ▶ The theme "A healthy environment" can be introduced quite effortlessly into this unit, and Critical Outcome 8 (Learners reflect on and explore a variety of strategies to learn more effectively) is applicable here.
 - For the portfolio: An interesting activity can be undertaken here – see Activity 2.1. If it is to be assessed, a matrix must be supplied.
 - This learning unit should be completed within 2-3 weeks.

IN LEARNING UNIT 3

- ▶ Focuses on a variety of methods for subtraction. Remember that learners are allowed to use their own strategies, but at the end of grade 5 they should all be able to subtract vertically.
- ▶ Make sure that the learners are totally at ease with the correct terminology: minuend; subtrahend; difference; sequential numbers.
- ▶ This learning unit lends itself to the theme “Inclusively” and Critical Outcome 3 (Learners organise and manage themselves and their activities responsibly and effectively) and 8 (Learners reflect on and explore a variety of strategies to learn more effectively).
- ▶ Activity 3.1.1 or something similar is an assignment for the portfolio. Teachers must make sure that learners know exactly what is expected of them. The matrix for assessment must be given to the learners beforehand and explained so that they understand the process.
- ▶ 2-3 weeks should be sufficient time for the completion of this unit.

STEP BY STEP THROUGH MODULE 1

LEARNING UNIT 1

Number sense
(Activity 1-8)

Mental calculation
Counting forwards and backwards
Division by multiples of 10
Even and uneven numbers
Place value
Extended notation
Number patterns
Arranging from great to small
More than; less than
Relationship signs
Computations with 10 000s
Rounding off to the nearest 10, 100 and 1 000
Multiples
Factors
Prime numbers
Brain teasers

LEARNING UNIT 2

Addition
(Activity 1-11)

Mental calculation
Count in 10 000s
Addition by means of flow diagram
Addition using the constant function of the pocket calculator
Computations with Roman figures, using the commutative and associative properties of addition
Addition by rounding off first
Addition using number combinations
Problem solving
Comparing methods of addition
Addition using the memory of the pocket calculator
Assignment using cash slips
Brain teasers

LEARNING UNIT 3

Subtraction
(Activity 1 - 11)

Mental calculation
Computations with Maya Indian numbers
Computations with the pocket calculator
Number patterns
Subtraction by rounding off first
Problem solving
Comparison using subtraction methods
Calculating the difference
Assignment for portfolio using newspaper
Brain teasers

LEARNING UNIT 1: Number sense

.....ACTIVITY 1.1

- ▶ A certain time can be allocated for the mental calculation test. In the following test or module learners can be given less time in order to inspire them to improve their skills. The marks that learners obtain here can be included in the summarise mark (formal test).

.....ACTIVITY 1.2

- ▶ It is important that learners count loudly on a regular basis. The pocket calculator can be used to great advantage in this activity. For example: one learner can check the answers on the pocket calculator while his/her classmates carry out the instructions. Make sure that the learners understand that Activity 1.2 entails Addition/Subtraction, while they are required to divide in Activity 1.3 in order to calculate the answer.

.....ACTIVITY 1.3

- ▶ The concept *extended notation* must be explained thoroughly to learners at the outset (class discussion). The activity should not be finalised before this has been done. Make sure that the learners understand the difference between *value* and *place value* before attempting to start with Activity 1.4.

.....ACTIVITY 1.4

- ▶ Activity 1 can be done orally. The teacher can start off by asking the learners to answer similar questions – use small addends/minuends.
- ▶ In Activity 2 learners can work in pairs to find the missing answers. The pocket calculator can also be used here to check the answers.
- ▶ Less accomplished learners will find Activity 3 easier if they say the numbers loudly at first. A number line can also be used to good effect because the learners will be able to “see” where the numbers lie.

.....**ACTIVITY 1.5**

- ▶ Learners find it difficult to answer questions such as those in Activity 1 and 2. Make sure that the learners take note of the difference in the various ways in which the questions are asked, because that determines whether they are required to add or to subtract.

.....**ACTIVITY 1.6**

- ▶ The x tables should first be practised thoroughly before starting with Activities 1 and 2. This Activity could lead to an interesting discussion, as each learner will colour in differently. Discuss why there can be different possibilities. It is important for learners to understand that different tables can have the same multiple, for example “fish 24” fits in with both the 8x and the 12x table.
- ▶ It will be necessary to fully explain the concept of moving from thousands to ten thousands (Activity 4) during a class discussion before the work sheets are to be completed. Let the learners say the numbers in Activities 5 and 6 loudly first, as this will make it easier for them to answer the questions.

.....**ACTIVITY 1.7**

- ▶ Enough time should be spent on “rounding off”. Learners must be able to see the “pattern” between rounding off to the nearest 10, 100 and 1000. Use a number line to explain rounding off to learners who find it difficult to grasp, so that they can physically see the numbers.

.....**ACTIVITY 1.8**

- ▶ Learners must know their tables, and Activity 1 is an excellent exercise for “drilling” tables.
- ▶ The learners’ prior knowledge of “multiples”; “factors” and “prime numbers” must be tested at the start. Make sure that they know the difference between the above-mentioned before completing Activity 2 - 4. Remember: 1 is NOT a prime number!
- ▶ The “self assessments” throughout the unit can be a very good indication to a teacher whether he/she should go on to the next section of the work or not.
- ▶ The following summarise marks can be used: (Teachers can decide for themselves.)
- ▶ The two tables tests
- ▶ The two smaller tests that come after 1.5 no. 3 and 1.8 no. 4
- ▶ The formal test at the end of the Learning Unit

LEARNING UNIT 2

.....**ACTIVITY 2.1**

- Take note:** An interesting, additional assignment can be inserted here!
Instruct learners to find out how people in other local cultures count from 1–10, e.g. the Xhosas, Zulus, Sothos and/or Taiwanese, and Chinese if there are such learners at the school.

- ▶ It would be even more interesting if learners could write down the numbers in these languages.
- ▶ The whole class could then learn how to do it!
 - For the portfolio: (Teachers can also decide whether it should be a class assignment or not. If it is to be assessed, a suitable matrix should be used for assessment purposes.)
- ▶ Although Activity 1 is very simple, it is a very good test of the learners' understanding and therefore it is important that they should be able to do it correctly.
- ▶ In Activity 2 simpler numbers can be used to start off with – write a similar exercise on the board first. Where learners find the activity too easy, it can be adapted by inserting more difficult exercises. The pocket calculator can be used very effectively as a means of checking these answers.
- ▶ In Activity 4 the time can be adapted/curtailed – depending on the pace at which the learners progress.
- ▶ Learners may use the pocket calculator in Activity 5 to check their answers. However, the exercise should be done without the pocket calculator at first.

.....**ACTIVITY 2.2**

- ▶ It is important to ensure that learners actually know how to programme their pocket calculators before written work is attempted.

.....**ACTIVITY 2.3**

- ▶ This activity lends itself very well to an extra, interesting assignment for the bright learners who can progress rapidly. It can also be placed in the portfolio. Learners can do research on how people of other cultures wrote (not the Romans).

.....**ACTIVITY 2.4**

- ▶ Learners do not necessarily have to know the names of the different properties (commutative; associative and distributive) but they must be able to apply them correctly.

.....**ACTIVITY 2.5**

- ▶ Make sure that the learners still know how to round off to the nearest 10, 100 and 1 000 before starting with the activity. It may be necessary to demonstrate it once more with the aid of a number line for the benefit of slower learners. Place a great deal of emphasis on the estimation of answers in Activity 4 – not only for addition, but also for any other answers that have to be calculated.
- ▶ Practise other examples of number combinations as well, as in Activity 5. These become handy aids for learners to calculate answers more rapidly and without necessarily using pencil and paper.

.....**ACTIVITY 2.6**

- ▶ Use the learners' prior knowledge first by means of problem solving before the different methods of addition are attempted. Therefore learners may use any method to calculate the answers in Activity 1. However, they must be able to explain their methods to the rest of the class.

.....**ACTIVITY 2.7**

- ▶ This activity exposes the learners to a variety of methods for addition. The learners may select the method that they find easiest from these.

.....**ACTIVITY 2.8**

- ▶ Learners must work without a pocket calculator, but may use it afterwards to check their answers.

.....**ACTIVITY 2.9**

- ▶ Adapt the allocated time as you think fit.

.....**ACTIVITY 2.10**

- ▶ First explain how the pocket calculator's memory keys work during a class discussion before attempting the activity. Allow learners to compare their pocket calculators with each other and encourage them to test and use the keys as the class discussion progresses. Do some examples with the learners by way of a trial run. (Hint: It is easier to calculate the answers if the last bracket in the computation of the sum is done first and stored in the memory.)

.....**ACTIVITY 2.11**

- ▶ According to the minimum requirements of the RNCS, two "investigations" are required per semester. This activity can be placed in the learner's portfolio for record purposes. The purpose of this activity is to investigate the different cash slips that we receive every day wherever we buy things, to analyse them and finally to decide, giving reasons, which are the best examples of such slips.

LEARNING UNIT 3

.....**ACTIVITY 3.1**

- ▶ Before starting with Activity 1, the learners can do quite a bit of mental calculation with small minuends (orally, with teacher asking the questions), e.g. $34 - 5$; $26 - 3$; $52 - 4$; etc.). A certain time limit can be set in Activity 2 (depending how fast / how slowly) the learner's progress.

.....**ACTIVITY 3.2**

- ▶ Once this activity has been completed, learners' knowledge with regard to Learning Unit 2 can be tested. Learners can do the same exercise with Roman numbers (see Activity 2.3).

.....**ACTIVITY 3.3**

- ▶ It is important that learners do this activity with full understanding of terminology (e.g. they should know that "decrease by" means "subtract"). The pocket calculator can be used to check the answers in this activity.

.....**ACTIVITY 3.4**

- ▶ This is a revision of Activity 2. Learners can check each other's work with a pocket calculator at the end of the activity.

.....**ACTIVITY 3.5**

- ▶ It is important for learners to understand that the flow diagram can be done "more easily" if they simply deduct 40 every time. Make sure that the learners are able to complete the flow diagram from back to front by doing the inverse computation as well.

.....**ACTIVITY 3.6**

- ▶ Revise rounding off to the nearest 10, 100 and 1 000.

.....**ACTIVITY 3.7**

- ▶ If there is no specific time allocation for the completion of the test, "reward" the learner who finishes first and / or obtains the highest marks, so that this will serve as an incentive to enhance their skills.

.....**ACTIVITY 3.8**

- ▶ Use the learners' prior knowledge by means of problem solving before examining the different methods of subtraction. Learners may, therefore, use any method to calculate the answers in Activity 1. However, they must be able to explain their methods to the rest of the class.

.....**ACTIVITY 3.9**

- ▶ This activity exposes the learners to a variety of methods for subtraction. The learners may select the one(s) they find easiest.

.....**ACTIVITY 3.10**

- ▶ Here the importance lies not only in the method(s) used by the learners, but also in the correctness of the chosen method(s). Let the learners explain and compare their methods and then allow them to use the pocket calculator to check their answers.

.....**ACTIVITY 3.11**

- ▶ This activity can also be used as an assignment for the portfolio. Learners must receive the matrix for assessment in advance, so that they will know exactly what will be assessed.

MEMORANDUM GRADE 5 MODULE 1

LEARNING UNIT 1

1. NUMBER CONCEPT

.....ACTIVITY 1.1

1.1	20	1.11	30
1.2	28	1.12	8
1.3	25	1.13	9
1.4	24	1.14	12
1.5	6	1.15	9
1.6	76	1.16	108
1.7	9	1.17	45
1.8	7	1.18	81
1.9	48	1.19	7
1.10	11	1.20	12

.....ACTIVITY 1.2

2. 2.1 add 12
 2.2 less 40
 2.3 less 12
 2.4 add 12
 2.5 add 28
3. 3.1 9; 11; 28; 100; 456
 3.2 9; 1; 30; 82
 3.3 2; 8; 11; 17
4. 4.1 99
 4.2 36

.....ACTIVITY 1.3

1. 1.1 A: 2 613
 B: 4 871
- 1.2 A: $2\ 613 = 2\ 000 + 600 + 10 + 3$
 $= (2 \times 1\ 000) + (6 \times 100) + (1 \times 10) + (3 \times 1)$
 B: $4\ 871 = 4\ 000 + 800 + 70 + 1$
 $= (4 \times 1\ 000) + (8 \times 100) + (7 \times 10) + (1 \times 1)$
3. 3.1 800; 6
 (8×100) ; (6×1)
- 3.2 4 000; 90
 $(4 \times 1\ 000)$; (9×10) ; (8×1)

- 4. 4.1 20
- 4.2 8
- 4.3 5 000
- 4.4 600

BRAIN TEASERS!

- a) 7 846
- b) 7 740
- c) 3 251
- d) 8 292
- e) 10
- f) 100

.....ACTIVITY 1.4

- 1. 11; 25; 6; 12; 11; 15; 27; 34
24; 8; 14; 9; 17; 13; 11; 12
- 2. 2.1 519; 527; 535; 543
2.2 825; 810; 795; 780
2.3 3 770; 3 779; 3 797; 3 806
2.4 99 800; 9 760; 9 640; 9 600
- 3. 3.1 3 003; 333; 330; 303; 33
3.2 6 666; 6 606; 6 600; 6 060; 6 006

.....ACTIVITY 1.5

- 1. 1.1 8 366
1.2 7 452
1.3 8 664
1.4 9 548
- 2. 2.1 6 750
2.2 8 260
2.3 3 516
2.4 9 379
- 3. 3.1 <
3.2 <
3.3 <
3.4 <

Answer on p. 11-12

- | | | | |
|----|----------|-----|----------|
| 1. | 46 | 6. | 4 440 |
| 2. | 26 | 7. | 7 739 |
| 3. | 39 337 | 8. | = |
| 4. | 5 000 D) | 9. | 14; 5 |
| 5. | 4 072 j) | 10. | 1 000; 8 |

.....**ACTIVITY 1.6**

- 1.1 24; 48; 64; 32; 120; 16; 96; 88
 1.2 36; 18; 45; 81; 54; 63; 108;
 1.3 36; 24; 48; 144; 60; 120; 96; 108;

- | | | | |
|------|------|------|-------|
| 2.1 | 27 | 2.11 | 8 |
| 2.2 | 68,5 | 2.12 | 43 |
| 2.3 | 10 | 2.13 | 112 |
| 2.4 | 6 | 2.14 | 72 |
| 2.5 | + | 2.15 | 134 |
| 2.6 | 54 | 2.16 | 4 |
| 2.7 | 7 | 2.17 | 132 |
| 2.8 | 300 | 2.18 | 84 |
| 2.9 | 300 | 2.19 | 3 600 |
| 2.10 | 984 | 2.20 | 7 000 |

- | | | | |
|-----|--------|-----|--------|
| 3.1 | 10 000 | 3.3 | 10 000 |
| 3.2 | 10 000 | 3.4 | 10 000 |

4. 1 000; 10 000

5. (i) twenty three thousand nine hundred and eighteen
 (ii) forty seven thousand and seven

6. 6.1 A: 10 000
 B: 12 500
 C: 14 000
 D: 16 500
 E: 18 000

- 7. 7.1 10
- 7.2 100
- 7.3 1 000
- 7.4 60 000
- 7.5 100
- 7.6 10
- 7.7 36 567
- 7.8 16 824
- 7.9 3 612
- 7.10 10 000

.....**ACTIVITY 1.7**

- ▶ hundreds
- ▶ thousands / add one
- ▶ hundreds

- 1. 1.1 a) 600
- b) 900
- c) 500
- d) 1 200

- 1.2 a) 3 000
- b) 8 000
- c) 26 000
- d) 57 000

- 1.3 a) true
- b) true
- c) true
- d) true

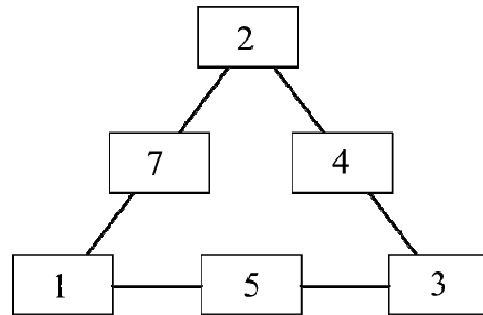
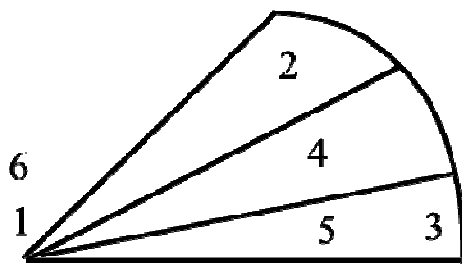
- 1.3 a) true
- b) true
- c) true
- d) true

.....**ACTIVITY 1.8**

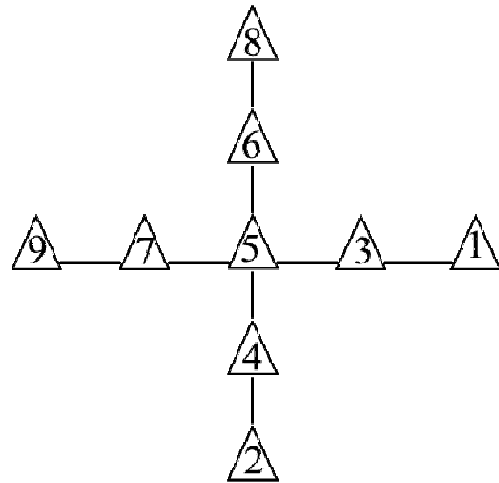
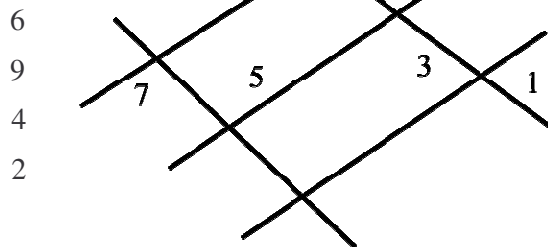
- 1. 6; 12; 18; 24; 30; 36; 42; 48; 54; 60; 6; 72
- 7; 14; 21; 28; 35; 42; 49; 56; 63; 70; 7; 84
- 8; 16; 24; 32; 40; 48; 56; 64; 72; 80; 8; 96
- 9; 18; 27; 36; 45; 54; 63; 72; 81; 90; 9; 108

2. 72; 24; 48; 96; 108; 60
3. 1; 2; 5; 10
1; 3; 5; 15
1; 2; 4; 8; 16
1; 2; 3; 4; 6; 8; 12; 24
1; 2; 3; 5; 6; 10; 15; 30
4. 13; 2; 17; 11; 5; 23; 7; 19; 3; 29

5. 5.1



5.2 b)



1. 10 000
2. twenty six thousand four hundred and nine
3. 300
4. 5 000
5. 6; 12; 18; 24
6. 1; 2; 3; 4; 6; 12
7. true
true

TEST 1

1. $6\,000 + 400 + 90 + 8$
 $(6 \times 1\,000) + (4 \times 100) + (9 \times 10) + (8 \times 1)$

2. a) 200
b) 70 000

3. a) 2 674
b) 16 537
c) 800

4. a) 7 420; 7 440
b) 16 775; 16 750

6. a) >
b) >

7. a) seventy six thousand and eight
b) 68 439

8. a) (i) 1 800
(ii) 34 700
b) (i) 5 000
(ii) 78 000

9. a) 6; 12; 18; 24
b) 1; 3; 17; 19
c) 1; 2; 3; 4; 6; 12
d) 2; 17; 19
e) 2; 4; 6; 12; 18; 24; 40

LEARNING UNIT 2

ADDITION

.....ACTIVITY 2.1

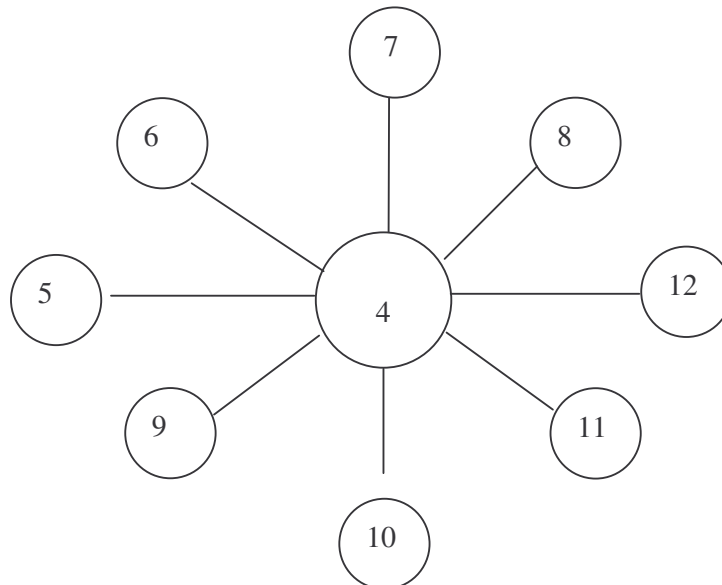
- 1.1 7
- 1.2 4
- 1.3 2
- 1.4 7
- 1.5 4

2.1 432; 214; 1 346; 1 020; 8 421; 6 045

2.2 512; 294; 1 426; 1 100; 6 125

2.3 1 482; 1 264; 2 396; 2 070; 9 471; 7 095

3.



4.

4.1	26
4.2	66
4.3	34
4.4	44
4.5	94
4.6	49
4.7	49
4.8	351
4.9	368
4.10	9 984

4.11	32
4.12	48
4.13	48
4.14	6
4.15	24
4.16	96
4.17	132
4.18	7
4.19	15
4.20	44

5. 33 000; 43 000; 53 000; 63 000; 73 000; 83 000; 93 000; 103 000;
113 000; 123 000; 133 000

.....**ACTIVITY 2.2**

1. 262; 364; 466; 568; 670; 772; 874; 976; 1 078
2. 2.1 2 589; 2 592; 2 596; 2 598; 2 601; 2 604; 2 607
2.2 7 939; 8 039; 8 139; 8 239; 8 339; 8 439; 8 539
2.3 18 213; 28 213; 38 213; 48 213; 58 213; 68 213; 78 213; 88 213

.....**ACTIVITY 2.3**

xi

xv

watches

2. 2.1 XLII
2.2 XCIX
2.3 MMDL
3. 3.1 608
3.2 65
3.3 3 257
4. Will differ from year to year

BRAIN TEASER

1. Move “minus” to just before “x” so that sum reads $1 \times 1 = 1$
2. Take one away from = and add to – so that sum reads $1 = 111 - 11$

.....**ACTIVITY 2.4**

1. 1.1 $9 + (8 + 7) = 24$
 $121 + 32 = 153$ / $140 + 13 = 153$
 $338 + 100 = 438$ / $396 + 42 = 438$

.....**ACTIVITY 2.5**

1. Look at the unit’s digit.
If it is 5 or more, the tens digit becomes one more.
If it is 4 or less, the tens digit remains the same.

2. Look at the tens digit.
If it is 5 or more, the hundreds digit becomes one more.
If it is 4 or less, the hundreds digit remains unchanged.

3. Look at the hundreds digit.
If it is 5 or more, the thousands digit becomes one more.
If it is 4 or less, the thousands digit remains the same.

2. 2.1 $20 + 10 + 20 = 50$
2.2 $30 + 10 + 50 = 90$
2.3 $10 + 20 + 20 = 50$
2.4 $100 + 200 + 300 = 600$
2.5 $200 + 100 + 100 = 400$

3. “Estimated answer” and “Difference” will be different as a result of the method applied. Pocket calculator gives correct answer.

4. a) 279
b) 1 660
c) 6 581
d) 2 843

5. Answers will vary – many combinations possible
6. $35 + 15$; $47 + 3$; $23 + 27$
 $50 + 150$; $25 + 175$; $10 + 190$; $180 + 20$; $170 + 30$
 $250 + 750$; $400 + 600$; $900 + 100$; $200 + 800$; $990 + 10$

6. $250 + 750$; $125 + 825$; $950 + 50$; $450 + 550$; $225 + 775$; $415 + 585$

7. $5\ 000 + 400 + 80 + 9 + 300 + 60 + 2 + 1\ 000 + 500 + 70$
 $= (5\ 000 + 1\ 000) + (400 + 300 + 500) + (80 + 60 + 70) + (9 + 2)$
 $= 6\ 000 + 1\ 200 + 210 + 11$
 $= 7\ 421$

.....**ACTIVITY 2.7**

Counting on

Take away 11 400 every time and add the rest

- 1.3 Keep 1 000s, 100s and 10s apart and add
- 1.4 Counting on: first 10 000s, then 1 000s, then 100s, then 10s and lastly units

- 1.5 Self-explanatory
- 1.6 Carry over method
- 2. Own answer

- 3.2 Short method of addition, without carry over numbers
- 3.3 a) 83 320
b) 105 935

.....**ACTIVITY 2.9**

1.1	830
1.2	14
1.3	12
1.4	99
1.5	27
1.6	12 and a half
1.7	84
1.8	185
1.9	196
1.10	64

1.11	29 and a half
1.12	5
1.13	7
1.14	158
1.15	60
1.16	7
1.17	8
1.18	80
1.19	0
1.20	170

.....**ACTIVITY 2.10**

- 2. 1.3 1 236

- 3.1 10 876 + 23 982 M+
43 567 + 21 309 M+
RM = 130 254
- 3.2 42 861 + 13 579 M+
49 478 + 24 336 M+
RM = 130 254

- 4. 2 x 17.99 M+
3 x 14.99 M+
2 x 6.98 M+
2 x 16.99 M+
RM = 128.89

.....**ACTIVITY 2.11**

Answers may differ

TEST 2

1.1 1493

1.2 $469 + 1\,426$

2.1 34 367

2.2 24 809

3. 300; 436; + 47; 751

4.1 1 3900

4.2 29 100

5. 39018

6. R3 216,72

7. $3,2603915 + 23\,684\,193 = 23\,684\,196$

Total: 20





LEARNING UNIT 3

.....ACTIVITY 3.1

2. SUBTRACTION

3.1	8	3.11	18
3.2	28	3.12	14
3.3	47	3.13	8
3.4	40	3.14	12
3.5	340	3.15	45
3.6	3 580	3.16	450
3.7	18 200	3.17	350
3.8	18 050	3.18	25 000
3.9	10 250	3.19	1 500
3.10	8 250	3.20	250

.....ACTIVITY 3.2

- 1.1 
- 1.2 
- 1.3 
- 1.4 

- 2.1 $19 - 7 - 2 = 10$
- 2.2 $21 - 11 - 4 = 6$
- 2.3 $20 - 3 - 5 - 6 = 6$

.....ACTIVITY 3.4

- 1.1 6 550; 6 400; 6 250
- 1.2 14 345; 14 330; 14 285
- 1.3 122 500; 122 000; 120 500

.....ACTIVITY 3.5

1. a) 40 b) 420 c) 1 780 d) 24 270
3. less 40 because $19 + 1 = 20$ and $21 - 1 = 20$

BRAIN TEASER

- a) 41 and 42
- b) 118 and 119
- c) 88 and 89
- d) 100 and 101

.....ACTIVITY 3.6

- 1.1 (a) 510 (b) 810 (c) 860 (d) 1 400 (e) 1 860
- 1.2 (a) 800 (b) 300 (c) 2 500 (d) 1 700
- 2.2 a) $16\ 00 - 10\ 000 = 6\ 000$
- b) $98\ 000 - 46\ 000 = 52\ 000$
- c) $642\ 000 - 23\ 6000 = 406\ 000$
- d) $926\ 000 - 759\ 000 = 167\ 000$
- e) $2468000 - 1129000 = 1339000$

.....ACTIVITY 3.7

- | | | | |
|------|-----|------|-----|
| 1.1 | 24 | 1.11 | 42 |
| 1.2 | 34 | 1.12 | 72 |
| 1.3 | 200 | 1.13 | 132 |
| 1.4 | 30 | 1.14 | 8 |
| 1.5 | 111 | 1.15 | 6 |
| 1.6 | 8 | 1.16 | 7 |
| 1.7 | 180 | 1.17 | 72 |
| 1.8 | 298 | 1.18 | 9 |
| 1.9 | 35 | 1.19 | 318 |
| 1.10 | 995 | 1.20 | 342 |

.....ACTIVITY 3.8

- 1.1 2 614
- 1.2 5 860
- 2-4 Own answer

.....ACTIVITY 3.9

- 2.1 and 2.2 own answer

.....**ACTIVITY 3.10**

1.1 27 848

1.2 18 121

1.3 254 706

2.1 $8\ 486 - 5\ 456 = 3\ 030$

$84\ 381 - 54\ 351 = 30\ 030$

$86\ 488 - 56\ 455 = 30\ 033$

$816\ 823 - 516\ 523 = 300\ 300$

$814\ 886 - 514\ 556 = 300\ 330$

2.2 297 300

3.1 (b) R27 414

3.2 (a) 22 526

(b) 65 778

(c) 668 544

BRAIN TEASER

(a) $378 - 111 = 267 - 110 = 157 - 10 = 147$

(b) $2\ 598 - 1\ 111 = 1\ 487 - 1\ 111 = 376 - 110 = 266$

(c) $14\ 210 - 110 = 14\ 100 - 100 = 14\ 000$

.....**ACTIVITY 3.11**

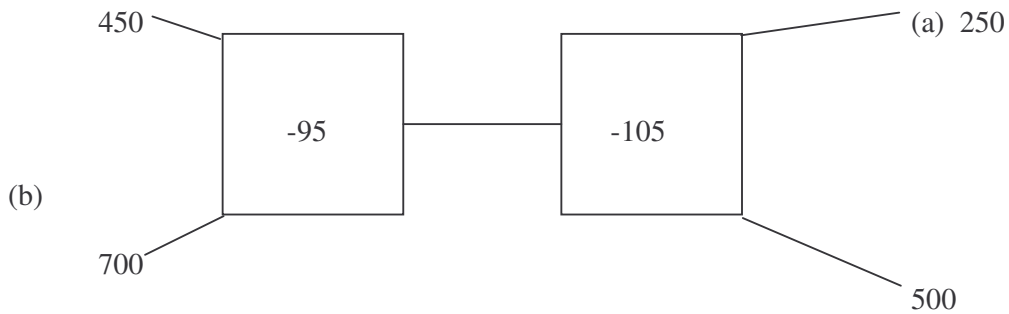
Own opinion

TEST 3

TOTAL: 20

1. (a) Difference
(b) Addition
(c) Minuend

2. (a) 105; 70;
(b) 480; 360;



4. $46\ 000 - 23\ 000 = 23\ 000$

5. 1 450

6. $23\ 600 + 400 = 24\ 000$
 $24\ 000 + 32\ 123 = 56\ 123$
 $32\ 123 + 400 + 31 = 32\ 554$

7.
$$\begin{array}{r} 5\ 8\ 1\ \overset{1}{\cancel{2}}\ \overset{14}{\cancel{4}} \\ -\ 2\ 6\ 3\ 5\ 7 \\ \hline 3\ 1\ 7\ 6\ 7 \end{array}$$

8. R500 000 – R13 401
R486 599

LEARNING PROGRAMME GRADE 6 MODULE 1

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.

1. NUMBER CONCEPT; ADDITION AND SUBTRACTION (LO 1 and LO 2)

LEARNING UNIT 1: NUMBER CONCEPT

This learning unit focuses on:

- ▶ Mental calculation skills
 - ▶ Writing numbers in extended notation
 - ▶ Comparison and arrangement of numbers
 - ▶ Extension of learner's concept of numbers to 100 000 and 1 000
 - ▶ The ability to round off to the nearest 100 and 1 000
 - ▶ Revision of the learner's knowledge of multiples, factors and prime numbers
 - ▶ Sequence of operations
 - ▶ Powers of 10
- ▶ Critical Outcomes 2 (Operating effectively with other members of a team, a group, an organisation and a community) and 5 (Communicating effectively by means of visual, symbolic and/or language skills in different manners) are applicable in this instance.
 - ▶ As this is the first learning unit for the year, it will probably take 3 – 4 weeks to complete.

LEARNING UNIT 2: FOCUSES ON ADDITION

- ▶ This learning unit consolidates and extends the work completed in Grade 5. Learners should be able to add large numbers vertically. Allow sufficient time to focus on the grouping of numbers to facilitate addition. Additional sums that deal with money as it is used in everyday life can be incorporated here.

- ▶ The theme of "A Healthy Environment" could be fitted into this learning unit (E.g. by means of a class discussion on neatness / conditions of hygiene at supermarkets and other places where we buy foodstuffs, or entrepreneurs who run their own food stalls.
- ▶ Activity 2.9 comprises a task to be included in the portfolio.
- ▶ Educators should provide the assessment grid in advance so that the learners will be aware of how they are to be assessed.
- ▶ This learning unit is relevant to the following Critical Outcomes: CO 6 (Using Science and Technology effectively and critically), with learners providing evidence of their sense of responsibility towards nature and towards the health of other people; CO 9 (Participating as responsible citizens on the level of the local, national and global community); and CO 12 (Development of entrepreneurial opportunities). It should be possible to complete the work in 2 - 3 weeks.

LEARNING UNIT 3: FOCUSES ON SUBTRACTION.

- ▶ In this learning unit we mainly work with the different methods of subtracting. Learners should be able to do vertical subtraction of larger numbers.
 - ▶ Activity 3.11 comprises a task to be included in the portfolio.
 - ▶ Educators have to ensure that learners know exactly what is expected of them. The assessment grid must also be made available and explained to learners in advance.
- ▶ The theme of "Human Rights" can be introduced here (E.g. the issue around budgeting and pocket money). The relevant Critical Outcomes are as follows: CO 1 (Identifying and solving problems and applying critical and creative thinking in taking decisions); CO 3 (Organising oneself and one's activities effectively and responsibly); and CO 9 (Participating as responsible citizens on the level of the local, national and global community). Allow 2 - 3 weeks for the completion of this module.

2. MULTIPLICATIONS AND DIVISION (LO 1: 2 AND 5)

LEARNING UNIT 1 FOCUSES ON MULTIPLICATION.

- ▶ Revise the basic terminology as dealt with in grade 5. Stress the different properties of multiplication (See pages 2 and 3). Also stress the different strategies that make it easier to multiply (see activities 6 and 7)>
- ▶ ** Activity 13 is meant for inclusion in the portfolio.
- ▶ Educators should ensure that learners know exactly what is expected of them. The assessment grid should be given and explained to the learners in advance.
- ▶ Critical Outcome 4 (Gathering, analysing, organising and critically evaluating information) is applicable.
- ▶ This module can be completed in 2 to 3 weeks.

LEARNING UNIT 2 FOCUSES ON DIVISION.

- ▶ Correct terminology and division by multiples of 10, as learnt in grade 5, should be revised. Also attend to estimation and rounding off. Learners should be able to divide larger numbers that have a remainder.
- ▶ ** Activity 11 is intended for the portfolio. Where possible, educators should provide learners with newspapers to enable them to execute assignments. Learners should know how they would be assessed before they start the activity.
- ▶ This module meets the requirements for Critical Outcome 2 (Working effectively as a member of a team, an organisation or a community) and should take 2 to 3 weeks to complete.

3. 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.

4. MEASUREMENT AND TIME (LO 1, 2, 4 AND 5

LEARNING UNIT 1 FOCUSES ON LENGTH.

- ▶ Emphasise the use of correct abbreviations. Also spend adequate time on explaining how to convert correctly from one unit to another, as learners usually find this quite complicated. Be convinced that the learners understand the different formulas for calculating perimeter and are able to apply them correctly so that they will not be confused when they start to work with area. Also pay attention to the calculation of averages as this has not been dealt with before.

LEARNING UNIT 2 FOCUSES ON AREA.

- ▶ Ensure that the learners understand the difference between area and perimeter. Also ensure that they know the correct formulas and are able to apply them. The calculation of area of irregular figures is also dealt with. Allow extra time for this, if necessary, so that learners will be able to do the calculations.

LEARNING UNIT 3 FOCUSES ON MASS.

- ▶ Learners must be able to read measuring scales / a balance. The emphasis, however, is on the correct application of the 4 main operations in calculating mass.

LEARNING UNIT 4 FOCUSES ON CAPACITY.

- ▶ Here learners should be able to do the conversions correctly. They should also be able to read capacity correctly from a measuring cup. As in the previous learning unit, the emphasis is on accurately solving problems in context.

LEARNING UNIT 5 FOCUSES ON VOLUME.

- ▶ It is important for the learners to know the formula and to apply it correctly.

LEARNING UNIT 6 FOCUSES ON TIME.

- ▶ Ensure that the learners learn the correct abbreviations.
- ▶ Also point out the correct way of writing time as shown on a digital clock (international time). Learners must be taught to add and subtract time correctly. Adequate attention should therefore be given to correct conversion of units of time.

LEARNING UNIT 7 FOCUSES ON TEMPERATURE.

- ▶ Spend sufficient time on instructing learners on negative numbers before starting to read the thermometer.
- ▶ Module 4 is applicable to Critical Outcome 3 (Learners are able to organise themselves and their activities in a responsible and effective manner) and 5 (Communicating effectively by using visual means, symbolic means and /or language skills in a variety of ways).
- ▶ It should be possible to complete the work of the module in 3 to 4 weeks.

5. GEOMETRY, HANDLING DATA AND PROBABILITY (LO 1, 3, 4 AND 5)

LEARNING UNIT 1 FOCUSES ON GEOMETRY:

- ▶ Check to ensure that learners know the correct terminology: parallel, line, line segment, radius, angle, vertex, etc. Learners should also be able to identify the different types of angles and measure them correctly. Attend to how angles are measured with a protractor.
- ▶ Learners should also describe two-dimensional figures in terms of their properties. They should be able to indicate differences and similarities. By this time learners should also know what symmetry is and educators could extend their knowledge to include rotational symmetry. This Learning Unit also provides opportunity for enlarging/magnifying and reducing figures. Circles are investigated and learners should be able to use a pair of compasses to draw patterns.
- ▶ Three-dimensional figures are discussed. Learners should have a chance to build such forms (see Activity 11) for practical comparison.
- ▶ Towards the end of the unit, learners have an opportunity to find locations on a map with the help of coordinates. Attend to the manner in which coordinates have to be read.
- ▶ The Learning Unit could be completed in 2 to 3 weeks.

LEARNING UNIT 2 FOCUSES ON HANDLING DATA:

- ▶ Learners have to be able to collect data, and organise and record the collected data. They should also learn how to read and interpret data critically. Graphs are also investigated.
- ▶ Learners should be able to determine the modus, median and arithmetic average of some data.
- ▶ ** Activity 7 comprises a task planned for inclusion in the portfolio. Ensure that learners have a clear understanding of what is expected of them and know how their work will be assessed.
- ▶ The Learning Unit could be completed in 2 weeks.

LEARNING UNIT 3 FOCUSES ON PROBABILITY:

- ▶ Learners need to be able to determine probability in a particular situation. They also have to be able to indicate relative frequency in particular situations.
- ▶ The Critical Outcomes that relate to this Learning Unit are: CO 3 (Learners organise themselves and their activities in a responsible and effective manner); CO 4 (Collecting, analysing, categorising and critically evaluating information); and CO 5 (Communicating effectively in a variety of manners, using visual and symbolic means and / or by means of language skills)
- ▶ The Learning Unit could be completed in 1 week.

STEP BY STEP THROUGH MODULE 1

LEARNING UNIT 1: NUMBER CONCEPT

.....ACTIVITY 1.1

- ▶ Learners have had various opportunities to practise mental calculation in Grade 5. They should therefore be well acquainted with this aspect, so this activity is aimed at brushing up on their skills. The time allocated for the test may be limited, but educators should take this decision with circumspection, as this is the first mental calculation exercise of the year.
- ▶ Counting skills could also be brushed up through practice.

.....ACTIVITY 1.2

- ▶ This activity also serves as revision of work completed in Grade 5. Learners should be able to discover patterns without assistance by now. Educators could explain how to 'discover' these patterns, where necessary.

.....ACTIVITY 1.3

- ▶ This activity is aimed at revising extended notation, which was also addressed in Grade 5.

.....ACTIVITY 1.4

- ▶ Ensure that the learners have a thorough grasp on the concept of a "hundred thousand" before this activity is undertaken. Allow plenty of practice in the correct way of writing this and for getting to know the place value of each digit/figure in the number.

.....ACTIVITY 1.5

- ▶ Learners will only be able to provide the relational symbols if they have acquired a sound understanding of the value of each digit to the left and to the right of the *. Provide further examples, if necessary.

.....ACTIVITY 1.6

- ▶ Although learners are permitted to use their pocket calculators, they should first be able to correctly interpret the concepts of "more than" and "less than". This involves knowing whether to add or to subtract. Provide further examples for weaker learners.

.....ACTIVITY 1.7

- ▶ Another activity requiring mental calculation, but in a different way

.....ACTIVITY 1.8

- ▶ Ensure that learners understand the concept of a "million", and are able to pronounce and write it correctly (noting the spaces between digits).

.....**ACTIVITY 1.9**

- ▶ This activity is meant to help consolidate the knowledge gained through earlier work.

.....**ACTIVITY 1.10**

- ▶ Learners will only be able to answer the questions if they have developed a proper understanding of the work. It is important for them to know **how** to do the work.

.....**ACTIVITY 1.11**

- ▶ This exercise will provide an indication of how well the learners understand millions, as well as the value of each number/figure or digit? If they find the exercise difficult to do, the pronunciation of numbers should be repeated, and they should focus again on the value and place value or digits in the number.

.....**ACTIVITY 1.12**

- ▶ This activity indicates to learners that numbers can be written in different ways. Stress that the number is **multiplied by itself** as many times as indicated by the small figure, and NOT multiplied by the small figure.

.....**ACTIVITY 1.13**

- ▶ This involves revision of rounding off. Learners should use their acquired knowledge to round off to the nearest 1 000.

.....**ACTIVITY 1.14**

- ▶ This presents an opportunity to improve mental calculation skills. Educators could set a fixed period of time for the activity.

.....**ACTIVITY 1.15**

- ▶ This activity is meant to be revision of work completed in Grade 5. Ensure that learners are well acquainted with the differences.

.....**ACTIVITY 1.16**

- ▶ Learners are introduced to palindromes. Ensure that they understand the concept and provide further examples, if necessary.

.....**ACTIVITY 1.17**

- ▶ This activity involves revision of the properties of 0 and 1.

.....**ACTIVITY 1.18**

- ▶ A considerable amount of time could be allowed for this, as learners frequently struggle to apply the principles correctly. Many more examples could be provided to ensure that this is properly consolidated.

LEARNING UNIT 2: ADDITION

.....ACTIVITY 2.1

- ▶ Another opportunity to improve mental calculation skills. Learners have to examine number 1 properly to ensure that they notice all the numbers.

.....ACTIVITY 2.2

- ▶ Learners have studied methods to facilitate adding in Grade 5. For this activity they should be able to group numbers correctly before adding them together.

.....ACTIVITY 2.3

- ▶ This activity involves revision of the properties of addition. Learners do not need to know that they are working with the 'distributive' or 'associative' property - they merely have to apply it correctly.

.....ACTIVITY 2.4

- ▶ Educators could expect learners to complete the test in 2 - 3 minutes.

.....ACTIVITY 2.5

- ▶ Learners are given an opportunity to make use of their own strategies for solving the problems. It is important that the educator offers as little input as possible, so that learners are obliged to apply their own methods. The class discussion after the activity is of cardinal importance, as learners will then be exposed to a variety of methods for solving the problems. Educators could make use of the opportunity to emphasise what they see as important and to explain anything that seems to be unclear.

.....ACTIVITY 2.6

- ▶ Educators must ensure that learners understand and are able to apply the different methods.

.....ACTIVITY 2.7

- ▶ This is an enjoyable activity taken from everyday life. It is important for learners to be able to read the cash slips. Rounding off and estimation are practised again. Learners also have an opportunity to find out what products actually cost and volume is revised simultaneously.

.....ACTIVITY 2.8

- ▶ In this activity learners have another opportunity to see the memory keys of the pocket calculator are operated. Stress the fact that this is a useful "aid" for completing a series of calculations quickly.

.....**ACTIVITY 2.9**

- ▶ ** This activity is for inclusion in the portfolio. Learners need a newspaper (The property guide). The task should be completed in the classroom. Ensure that the learners know what to do. Also discuss the assessment grid with them.

LEARNING UNIT 3: SUBTRACTION

.....**ACTIVITY 3.1**

- ▶ Another mental calculation exercise, but using a different method. Encourage the learners to colour in neatly and to write within the "cloud".

.....**ACTIVITY 3.2**

- ▶ Learners need to be able to do rounding off correctly to succeed in this exercise.

.....**ACTIVITY 3**

- ▶ This mental calculation test can be linked to a fixed time period.

.....**ACTIVITY 3.4**

- ▶ In this activity learners are able to investigate a number system that is different to our own.

.....**ACTIVITY 3.5**

- ▶ Learners are given an opportunity to use their own strategies for solving problems. It is important for educators to provide as little input as possible, so that learners are "forced" to use their own methods. The class discussion that is to follow the activity is of vital importance as the learners will be exposed to a variety of methods that can be used to solve the problems. Educators could make use of it to stress what they regard as important and to explain points that are unclear.

.....**ACTIVITY 3.6**

- ▶ In contrast with the previous activity, learners are now presented with methods for use. Check whether they understand all the methods.

.....**ACTIVITY 3.7**

- ▶ Learners now have to show whether they are able to apply the knowledge that they have gained correctly.

.....**ACTIVITY 3.8**

- ▶ This mainly tests the ability to calculate answers with small subtrahends. Ensure that learners know what it means to "treble" - after the test, though.

.....**ACTIVITY 3.9**

- ▶ In this activity, learners can discover how "expensive" life has become. They are therefore making contact with the everyday realities of life.

.....**ACTIVITY 3.10**

- ▶ This activity is linked to the previous one: It will be interesting to find out how prices of items have changed through the years! Pay attention to the correct calculation of the differences between past and present prices.

.....**ACTIVITY 3.11**

- ▶ ** This activity is for inclusion in the portfolio. It is important for learners to learn something about budgeting, even at a simple level. The most important aspect here is that they should be able to draw up a budget for themselves. Ensure that the learners understand what is at stake and that they know how their work will be assessed before they start the activity.

MEMORANDUM GRADE 6 MODULE 1

LEARNING UNIT 1

1. NUMBER CONCEPT

2.

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

.....ACTIVITY 1.2

- 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

.....ACTIVITY 1.3

- 1.1 $50\,000 + 400 + 30 + 6$
- 1.2 $90\,000 + 800 + 10 + 7$

BRAIN TEASER

100 000

100 000; hundred thousand

.....ACTIVITY 1.4

	HD	TD	D	H	T	E
1.1		6	0	9	8	0
1.2	5	0	8	1	3	6
1.3	5	0	4	6	0	0
1.4	8	2	6	0	4	0
1.5	4	0	7	0	0	5

.....**ACTIVITY 1.4**

3.1 $576\ 826 = 500\ 000 + 70\ 000 + 6\ 000 + 800 + 20 + 6$

3.2 $894\ 392 = 800\ 000 + 90\ 000 + 4\ 000 + 300 + 90 + 2$

.....**ACTIVITY 1.5**

1.1 $>$

1.2 $<$

1.3 $=$

1.4 $>$

1.5 $=$

.....**ACTIVITY 1.6**

1.1 1 065

1.2 2 466

1.3 28 745

1.4 50 271

1.5 373 097

1.6 462 563

BRAIN TEASER

12	54	24
42	30	18
36	6	48

.....**ACTIVITY 1.7**

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

1 000 000

.....**ACTIVITY 1.8**

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

.....**ACTIVITY 1.9**

- 1.1 200 000
- 1.2 5 000 000
- 1.3 80 000
- 1.4 20 000 000

.....**ACTIVITY 1.10**

- 1.1 16 667
694
2
- 2. No. Would have been 2 739 years old

.....**ACTIVITY 1.11**

Appelfontein; Radysland; Lemoenburg, Kersievilleville; Perskestad

.....**ACTIVITY 1.12**

- 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 $2 \times 2 \times 2 = 8$
- 2.2 $3 \times 3 \times 3 \times 3 = 81$
- 2.3 $5 \times 5 \times 5 = 125$
- 2.4 $1\ 000 \div 100 = 10$
- 2.5 $10 \times 10 \times 10 \times 10 \times 10 = 100\ 000$
- 2.6 6
- 2.7 9

.....**ACTIVITY 1.13**

- 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

BRAIN TEASER

- i) R90 000
- ii) R14 000

.....ACTIVITY 1.14

1.1	8
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

.....ACTIVITY 1.15

- 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 * 44
- 3.2 12
- 3.3 10
- 3.4 5

.....ACTIVITY 1.16

- 1.1 no
- 1.2 yes
- 1.3 yes
- 1.4 yes

.....ACTIVITY 1.17

- 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

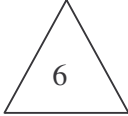
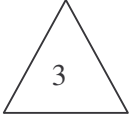
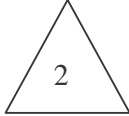
.....**ACTIVITY 1.18**

- 1.1 5
- 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

BRAIN TEASER

1.  -  = 

 \div  = 

 +  = 

2. Different solutions are possible. You are allowed to use a number more than once.

TEST 1

1.1 13 800; 13 750

1.2 24 360; 24 375

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

3.1 $<$

3.2 $=$

4.1 20 500

4.2 358 490

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

6.1 1296

6.2 6

7.1 40 000

7.2 6 million

8.1 37 000

8.2 149 000

9.1 48; 56; 64; 72

9.2 1; 2; 3; 4; 5; 6; 8; 12; 24

9.3 11; 13; 17; 19

10.1 true

10.2 false

10.3 false

11.1 114

11.2 34

11.3 70

11.4 6

LEARNING UNIT 2

ADDIOTION

.....ACTIVITY 2.1

1. 62; 63

2.1 – 2.15	9	+
	132	10
	17	63
	331	176
	498	7
	68.5	4
	1 000	450
	144	

.....ACTIVITY 2.2

1.1 $3\,272 + 128 = 3\,400$
 $1\,154 + 136 = 1\,290$
 $1\,103 + 97 = 1\,200$
SUM = 5 890

1.2 $138 + 622 = 760$
 $259 + 11\,011 = 11\,270$
 $235 + 25 = 4\,260$
SUM: = 16 290

2.1 Wrong: $640 + 360 + 5 + 2 - 2 = 1\,005$

2.2 Wrong: $2\,500 + 360 = 2\,880$

BRAIN TEASER

- $41\,186 + 23\,880 + 12 = 65\,078$
- $758\,817 + 100 + 118\,200 - 4 = 875\,113$
Various other possibilities

.....**ACTIVITY 2.3**

- 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

.....**ACTIVITY 2.4**

- | | | | |
|-----|---------|------|----------|
| 1.1 | 6 | 1.9 | 6 248 |
| 1.2 | 12 | 1.10 | 504 |
| 1.3 | 775 | 1.11 | 350 |
| 1.4 | 9 | 1.12 | 45 |
| 1.5 | 11 | 1.13 | 8 |
| 1.6 | 3 700 | 1.14 | 19 000 |
| 1.7 | 9 rem 3 | 1.15 | 1 rem 16 |
| 1.8 | 6 rem 5 | | |

.....**ACTIVITY 2.6**

- 2. Learner's own method

- 3.1 9 080 717
- 3.2 8 301 883
- 3.3 6 485 185

BRAIN TEASER

- | | | | |
|----|---|----|----|
| 1. | 4 | 2. | 1 |
| | 3 | | 2 |
| | 1 | | 3 |
| | 2 | | 3 |
| | 1 | | 44 |
| | 8 | | 1 |

.....**ACTIVITY 2.7**

- 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
- 1.9 Cashier 101
- 1.10 No payment

- 2. $R9 + R12 + R9 + R4 + R2 + R4 = R40$

- 3.1 1 litre full cream milk
1 kg chicken pieces
2 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

.....**ACTIVITY 2.8**

- 1. Amount will vary according to size of the learner's family and the age of the children in the family.

BRAIN TEASER

$$233 + 27 - 53 + 29 - 41 + 13 - 18 = 190$$

TEST 2

- 1. 1.1 Sum
1.2 Substraction

- 2. 2.1 True
2.2 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

LEARNING UNIT 2

.....ACTIVITY 3.1

1. 4
- 2.1 2 4
 2.2 3 3
 2.3 6 6
 2.4 5 5
 2.5 1 5
 2.6 7 2
 2.7 3 6

▶ Lets 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 | |

.....ACTIVITY 3.3

- | | |
|---------|----------|
| 1.1 8 | 1.9 176 |
| 1.2 132 | 1.10 7 |
| 1.3 17 | 1.11 4 |
| 1.4 330 | 1.12 500 |
| 1.5 100 | 1.13 718 |

- | | | | |
|-----|-----|------|------------------|
| 1.6 | + | 1.14 | $218\frac{1}{2}$ |
| 1.7 | 100 | 1.15 | 10 000 |
| 1.8 | 54 | | |

.....**ACTIVITY 3.4**

1. Before Christ
2. 5 502 / (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

.....**ACTIVITY 3.5**

- 1.1 56 702
- 1.2 R226 732
- 1.3 771 448
- 1.4 5 568 286

.....**ACTIVITY 3.7**

- 1.1 378 767
- 1.2 366 269
- 1.3 613 751

.....**ACTIVITY 3.8**

- | | | | |
|-----|--------|------|------------------|
| 1.1 | 15 | 1.9 | 53 |
| 1.2 | 33 | 1.10 | $612\frac{1}{2}$ |
| 1.3 | 93 | 1.11 | 123 |
| 1.4 | 995 | 1.12 | 12 |
| 1.5 | 9 997 | 1.13 | 19 |
| 1.6 | 99 995 | 1.14 | 6 |
| 1.7 | 130 | 1.15 | $\frac{1}{2}$ |
| 1.8 | 3 650 | | |

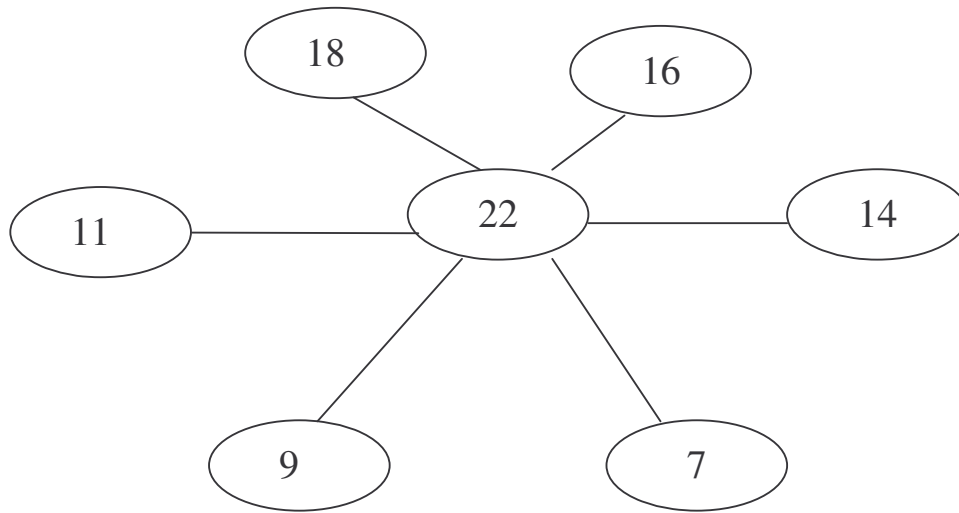
Puzzle out old code

1 286	1 335
- 539	- 934
<hr/>	<hr/>
747	101

TEST

TOTAL: 20

1.



2. a) 650 (3)
 b) 150
 c) 900 (3)

3. True
 True (2)

4.

		$\frac{1}{2}$	10			
	1	3	0	0	0	0
-		2	7	8	6	4
	1	0	(3)	(8)	(6)	(4)

(2)

5. 102 136
 6. 278 797 (4)
 7. 4 109 792

OUTLINE MATHEMATICS GRADE 7

MODULE 1: NUMBER PATTERNS

This module deals with a variety of number patterns. Learners also learn about square and triangular numbers. Here it is important that learners are able to recognise these number patterns and to apply them to number rows. The pocket calculator can also be used effectively.

Critical outcome 2 is applicable.

Because it is the first module of the year, it can take up to 3 weeks to complete.

MEMORANDUM GRADE 7 MODULE 1 LEARNING UNIT 1

1. NUMBER PATTERNS

- 3.1 135; 405; 1 215; 3 645
- 3.2 120; 720; 5 040; 40 320
- 3.3 72; 56; 42; 30
- 3.4 4 374; 1 458; 486; 162
- 3.5
- 3.6
- 3.7 20; 10; 5; 2.5

7.

- | | |
|----|-----|
| a) | 96 |
| b) | 61 |
| c) | 53 |
| d) | 13 |
| e) | 12 |
| f) | 54 |
| g) | 82 |
| h) | 24 |
| i) | 80 |
| j) | 178 |

- | | |
|----|--------|
| k) | 2 700 |
| l) | R90 |
| m) | R60,80 |
| n) | 24 000 |
| o) | 90 |
| p) | R237 |
| q) | |
| r) | |
| s) | |
| t) | 34.25 |

- 8.1 increases with one (+1)
- 8.2 increases with 7 (+7)
- 8.3 increases with 8 (+8)
- 8.4 increases with 6 (+6)

- 8.5.1 6; 27; 48
- 8.5.2 24; 27; 30
The total is different

8.5.3 27; 27
The total is the same

8.5.4 it is the same as above



9.2 16; 25

9.3 64

9.4 225

9.5 2 500

LEARNING UNIT 2

1.1 Yes

1.2 $25 + 26 + 27 + 28 + 29 + 30 = 31 + 32 + 33 + 34 + 35$
 $36 + 37 + 38 + 39 + 40 + 41 + 42 = 43 + 44 + 45 + 46 + 47 + 48$

2.1 10
20
30
40

2.2 120
It is actually 10×12

3.1 1
11
111

3.2.1 1 111

3.2.2 1 111 111

4. 4; 8; 12; 28; 40; 48

5. Row is faulty: must be 0; 1; 1; 2; 3; 5; 8; etc.

5.1 $0 + 1 = 1$; $1 + 1 = 2$; $2 + 1 = 3$; $3 + 2 = 5$; $5 + 3 = 8$; $8 + 5 = 13$; $13 + 8 = 21$;
 $21 + 13 = 34$

5.2 It follows the Fibonacci sequence

5.3 55; 89; 144

6.1

1	7	21	35	35	21	7	1		
1	8	28	56	70	56	28	8	1	
1	9	36	84	126	126	84	36	9	1

6.2.1 Answers may differ – it depends on the row chosen

6.2.2 The sum of the 2 numbers on top in the “triangle” is the third number below.

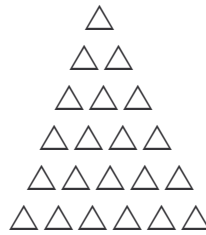
6.2.3 1; 2; 4; 8; 16; 32; 64; etc.

Answers multiply (x2)

6.2.4 512

7.1 1; 3; 6; 10

7.2



7.2 Sketch 5: 15

Sketch 6: 21

7.3.3.1 $10 \times (10 + 1) \div 2$
 $= 55$

$25 \times (25 + 1) \div 2$
 $= 325$

8.3.1 465

8.3.2 1 508

LEARNING UNIT 3

1.

a)	23
b)	37
c)	39
d)	70
e)	10
f)	25
g)	46
h)	290
i)	7 800
j)	4 900

k)	2
l)	5
m)	20
n)	5
o)	36
p)	42
q)	29
r)	4
s)	200
t)	2

2.1 12 321
1 234 321
123 454 321

2.2 12 345 654 321

3.1.1 9 109
3.1.2 18 218
3.1.3 27 327
3.1.4 36 436

3.2.1 633 763
3.2.2 81 981

4.1.1 111
4.1.2 222
4.1.3 333

4.2 Increases with 111

4.3.1 12
4.3.2 15

4.4 888

5.1.1 37 037
5.1.2 37 037
5.1.3 37 037

5.2.1 444 444 ÷ 12
5.2.2 555 555 ÷ 15

6.1.1 111 111
6.1.2 222 222
6.1.3 333 333

6.2.1 555 555
6.2.2 777 777

7.1.1 1 089
7.1.2 2 178
7.1.3 3 267
7.1.4 4 356

7.2 First 2 numbers increases with one at a time.
Last 2 numbers decreases with one at a time

7.3.1 99 x 55 = 5 445
7.3.2 99 x 66 = 6 534

TEST 1

- 1.1 0; -50
- 1.2 1 and a quarter; 1 and a half
- 1.3 22' 30
- 1.4 38; 26

- 2.1 number row
- 2.2 kwadraatgetalle
- 2.3 sequence
- 2.4 terms

- 3.1 horizontal
- 2.5 vertical

- 4.1 13; 21
- 4.2 Fibonacci

- 5.1 2 926

- 5.2 8

- 6. 10; 15

- 8. 7; 17; 23