

**GENERAL EDUCATION &
TRAINING PHASE (GET)**

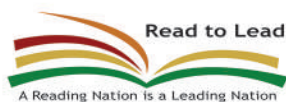
MATHEMATICS

SBA EXEMPLAR BOOKLET

GRADES 4-6



basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



FOREWORD



The Department of Basic Education has pleasure in releasing a subject exemplar booklet for School Based Assessment (SBA) to assist and guide teachers with the setting and development of standardised SBA tasks and assessment tools. The SBA booklets have been written by teams of subject specialists to assist teachers to adapt teaching and learning methods to improve learner performance and the quality and management of SBA.

The primary purpose of this SBA exemplar booklet is to improve the quality of teaching and assessment (both formal and informal) as well as the learner's process of learning and understanding of the subject content. Assessment of and for learning is an ongoing process that develops from the interaction of teaching, learning and assessment. To improve learner performance, assessment needs to support and drive focused, effective teaching.

School Based Assessment forms an integral part of teaching and learning, its value as a yardstick of effective quality learning and teaching is firmly recognised. Through assessment, the needs of the learner are not only diagnosed for remediation, but it also assists to improve the quality of teaching and learning. The information provided through quality assessment is therefore valuable for teacher planning as part of improving learning outcomes.

Assessment tasks should be designed with care to cover the prescribed content and skills of the subject as well as include the correct range of cognitive demand and levels of difficulty. For fair assessment practice, the teacher must ensure that the learner understands the content and has been exposed to extensive informal assessment opportunities before doing a formal assessment activity.

The exemplar tasks contained in this booklet, developed to the best standard in the subject, is aimed to illustrate best practices in terms of setting formal and informal assessment. Teachers are encouraged to use the exemplar tasks as models to set their own formal and informal assessment activities.



MR HM MWELI

DIRECTOR-GENERAL

DATE: 13/09/2012

Contents

1. INTRODUCTION	3
2. AIMS AND OBJECTIVES	3
3. EXEMPLAR ASSESSMENT TASKS	3
4. COGNITIVE LEVELS IN MATHEMATICS	4
5. ASSIGNMENT	5
(a) Purpose of a mathematics assignment	5
(b) Developing a mathematics assignment	5
(c) Administering a mathematics assignment	5
5.1. Grade 4 assignment exemplar	6
5.2. Grade 5 assignment exemplar	14
5.3. Grade 6 assignment exemplar	22
6. EXAMINATION	30
(a) Purpose of a mathematics examination	30
(b) Developing a mathematics examination	30
(c) Administering a mathematics examination	31
6.1. Grade 4 examination exemplar	32
6.2. Grade 5 examination exemplar	47
6.3. Grade 6 examination (framework)	66
7. INVESTIGATION	92
(a) Purpose of a mathematics Investigation	92
(b) Developing a mathematics investigation	92
(c) Administering a project	93
7.1. Grade 4 Investigation exemplar	94
7.2. Grade 5 investigation exemplar	99
7.3. Grade 6 investigation exemplar	105
8. PROJECT	112
(a) Purpose of a mathematics project	112
(b) Developing mathematics projects	112
(c) Administering a project	112
8.1. Grade 4: Project exemplar	114
8.2. Grade 6: Project exemplar	121

1. INTRODUCTION

Assessment in the National Curriculum Statement Grades R – 12 comprises School-Based Assessment (SBA) for subjects offered in the General Education and Training band (GET) and a final end-of-year examination.

School-Based Assessment is designed to address the content competencies, skills, values and attitudes of the subject, and to provide learners, parents and teachers with results that are meaningful indications of what the learners know, understand and can do at the time of the assessment.

School-Based Assessment allows for learners to be assessed on a regular basis during the school year. This assessment is a compulsory component for progression and promotion in all the different school phases and includes a variety of forms of assessment as contemplated in Chapter 4 of the Curriculum and Assessment Policy Statements. Moderation should ensure that the quality and standard of the School-Based Assessment, as contemplated in Chapter 4 of the Curriculum and Assessment Policy Statements, have been met.

2. AIMS AND OBJECTIVES

When the Department of Basic Education (DBE) engaged with the provinces and districts to strengthen the SBA, it was revealed that many schools across the country grapple to understand and develop good quality examinations, investigations and projects.

The purpose of this document is to provide both teachers and learners with a set of quality-assured SBA tasks. This document was also developed with an intention to engage Provincial Education Departments (PEDs) on aspects to be considered when capacitating their teachers on the setting of quality SBA tasks.

This document provides exemplar tasks that reflect the depth of Mathematics curriculum content appropriate for Grades 4, 5 and 6. Every effort has been taken to ensure that the distribution of marks in the tasks is in accordance with the cognitive levels of the taxonomy used in the Mathematics CAPS document.

3. EXEMPLAR ASSESSMENT TASKS

The exemplar assessment tasks in this booklet are presented according to the forms of assessment that include *Assignments*, *Examinations*, *Investigations* and *Projects* for the Intermediate Phase. Exemplars of each of these forms of assessment are meant to demonstrate to subject advisors and teachers how they should be developed. Detailed descriptions of these forms of assessment and issues to consider when developing them are presented prior to the actual exemplars. It is anticipated that PEDs will continue to mediate the exemplars and ensure that teachers acquire the skills of developing the SBA tasks for their learners.

4. COGNITIVE LEVELS IN MATHEMATICS

Effort was taken to ensure that the assessment tasks, especially examinations, comply with the following distribution of marks according to the cognitive levels as contemplated in Chapter 4 of CAPS for Mathematics:

Knowledge	Routine procedures	Complex procedures	Problem solving
25%	45%	20%	10%

In determining the level of complexity and cognitive demand of a task, consideration should be given to the extent to which the task requires the use of integrated content and skills drawn from different topics, the complexity of the context in which the problem is posed, the influence of non-mathematical considerations on the problem, and the extent to which the learner is required to make sense of the problem without guidance or assistance.

5. ASSIGNMENTS

(a) Purpose of a mathematics assignment

A mathematics **assignment**, as is the case with tests and examinations, is mainly an individualised task. It can be a collection of past questions, but should focus on more demanding work as any resource material can be used, which is not the case in a task that is done in class under supervision. An assignment could provide learners with the opportunity to consolidate a topic or section that has been covered in class, or to apply an approach or method studied in class to a new context, or to revise for tests and/or examinations. Both the content and contexts of the assignment are likely to be familiar to the learner.

(b) Developing a mathematics assignment

Since an assignment is primarily meant to consolidate the mathematics topics learnt and to prepare learners adequately for the test/examination, the questions constituting an assignment could be selected from the appropriate questions in the previous question papers. However, this does not preclude teachers from developing their own questions that are pitched at different cognitive levels as it is done when developing the examination questions.

(c) Administering a mathematics assignment

To ensure that the assignment serves its intended purpose of preparing learners for an examination, the timing of administering it should be opportune. In other words, an assignment should be administered just before an examination is administered.

5.1. Grade 4 assignment exemplar

Assignment

Total: 40 Marks

Name:

Date:

Time: 1 hour

Instructions:

- a) Write your name and date in the spaces provided.
- b) No calculators are allowed.
- c) Show calculations as requested on the question paper.
- d) The marks allocated are an indication of the number of steps per calculation.
- e) Check your answers.

Question 1: Circle the letter of the correct answer.

1.1 Eight hundred and forty-three can also be presented as:

- A 483 B 384 C 834 D 843

1.2 What must be added to 78 to make 90?

- A 12 B 22 C 14 D 2

1.3 The number 423 rounded off to the nearest 10 will be:

- A 430 B 420 C 400 D 300

[3 x 1 = 3]

Question 2 : Answer all the questions below:

2.1 Write 386 in words:

Answer: _____

2.2 Which number could be represented by the letter X on the number line?



Answer: _____

[2 x 1 =2]

Question 3: Make the sides equal:

3.1 $368 - \square = 368 + 0$

Answer: _____

3.2 $140 + 6 = 251 - \square$

Answer: _____

$[2 \times 1 = 2]$

Question 4:

Four starfish have 20 arms. How many starfish have 35 arms?

Answer: _____ [1]



Question 5:

5.1. What is the value of the underlined digit? 893

_____ [1]

5.2. Calculate the **difference in value** of the digits in the hundreds and tens place values in 893.

_____ [2]

5.3. What is the next even number after 144? _____ [1]

5.4. What is the next odd number after 671? _____ [1]

5.5. In this table:

5.5.1. List all the multiples of 5.

5.5.2. List all the multiples of 7.

41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

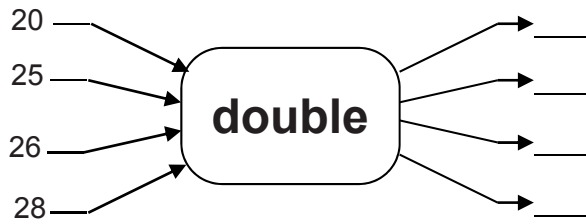
5.5.1.

5.5.2.

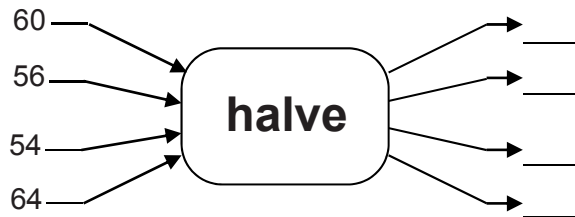
_____ [2]

Question 6: Complete:

6.1



6.2



[4]

Question 7: State whether the following is true or false

7.1 $51 + 14 = 14 + 51$

Answer: _____

7.2 $51 - 14 = 14 - 51$

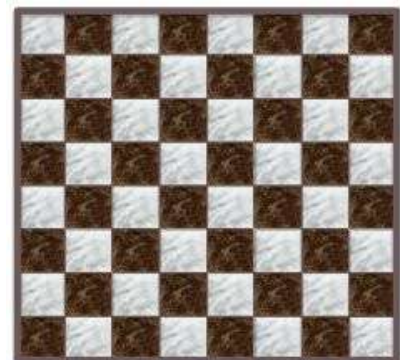
Answer: _____ [2]

Question 8:

A chessboard consists of squares arranged in two alternating colours (light and dark).

How many dark squares are there?

_____ [1]



Question 9: Number sentences:

Write a number sentence to represent the following word sum:

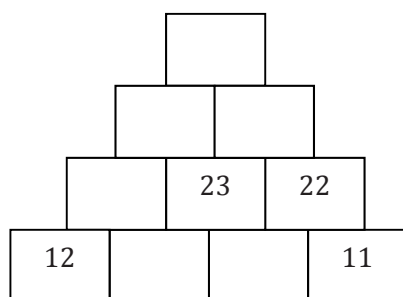
Zukie has 8 dolls. She gave 3 to her cousin. On her birthday she received three more dolls as presents. She now has eight dolls.

Answer: _____

[1]

Question 10:

Calculate the number at the top of the number pyramid. (Hint: Add the two numbers next to each other to get the number above it.) Complete: [1]

**Question 11:**

11.1 Use “multiplying by 100” and “halving” strategies to calculate: Show your workings

$$8 \times 50 = \underline{\hspace{2cm}}$$

$$50 \times 11 = \underline{\hspace{2cm}}$$

[2]

11.2 Calculate

$$321 + 564 =$$

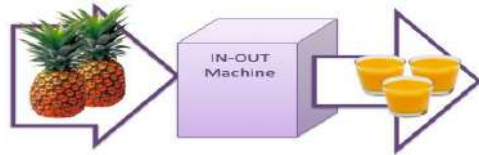
[3]

11.3 Calculate:

$$987 - 514 =$$

[3]

Question 12: Problem solving



12.1 Study the flow diagram. How many pineapples are needed to produce 6 glasses of juice?

_____ [2]

12.2 There are 245 men, 167 women and 189 children at a cricket game. How many people are there at the cricket game? [2]

12.3 Mr Pretorius has 156 cupcakes. He sells the same number to Ben and Adam. After selling the cupcakes he has 28 left. How many cupcakes did Adam get? [2]

12.4 Mrs Adams makes school uniforms. She buys 520 metres of blue material, 264 metres of grey material and 86 metres of yellow material. How many metres of material did she buy altogether? [2]

Bonus question: [2]

A rugby field is 100 metres long and 50 metres wide. How far will it be if you ran six times around the rugby field?

GRADE 4 ASSIGNMENT EXEMPLAR: MEMORANDUM

Assignment

Time: 1 hour

Memorandum

- a) Give full marks for answers only, unless otherwise stated.
- b) Accept any alternative mathematically correct solutions that are not included in the memorandum.
- c) CA refers to consistent accuracy.

Question	Expected answer	Explanation	Mark allocation	Total
1	1.1	D✓	1	1
	1.2	A✓	1	1
	1.3	B✓	1	1
2	2.1	Three hundred and eighty six✓	1	1
	2.2	777✓ Accept answers between 775 - 779	1	1
3	3.1	0✓	1	1
	3.2	105✓	1	1
4		7✓	1	1
5	5.1	90; 9T; 9 tens✓	Accept any one of these options 1	1
	5.2	$800 - 90 \checkmark = 710 \checkmark$	No marks if wrong digits were chosen 2	2
	5.3	146✓	1	1
	5.4	673✓	1	1
	5.5.1	45; 50; 55; 60; 65; 70✓	1 mark for all 6 numbers correct 1	1
	5.5.2	42, 49; 56; 63; 70✓	1 mark for all 4 numbers correct 1	1
6	6.1	40; 50; 52; 56✓	1 mark for all 4 numbers correct 1	1

	6.2	30; 28; 27; 32✓	1 mark for all 4 numbers correct	1	1
7	7.1	True✓		1	1
	7.2	False✓		1	1
8		32✓		1	1
9		$8 - 3 + 3 = 8$ ✓	Accept if brackets were added in correct place	1	1
10		92✓	Mark with possible errors	1	1
11	11.1	$8 \times 50 = 8 \times 100 \div 2 = 400$ ✓ $50 \times 11 = 100 \times 11 \div 2 = 550$ ✓		1 1	2
	11.2	$321 + 564 = 300+500+20+60+1+4$ ✓ $= 800+80+5$ ✓ $= 885$ ✓	Apply CA	3	3
	11.3	$987 - 514 = 900 - 500 + 80 - 10 + 7 - 4$ ✓ $= 400+70+3$ ✓ $= 473$ ✓	Apply CA	3	3
12	12.1	$2 \times 2 = 4$ ✓✓	Consider other mathematically correct method	2	2
	12.2	$245 + 167 + 189 = 601$ ✓✓	Full marks for correct answer	2	2
	12.3	$(156 - 28) = 128$ ✓ $128 \div 2 = 64$ Adam gets 64✓	Full marks for correct answer	2	2
	12.4	$520 + 264 + 86$ ✓ = 870 ✓	Full marks for correct answer	2	2
Bonus		1 800 metres✓✓	Full marks for correct answer	2	2
Total					40

5.2. Grade 5 assignment exemplar

Mathematics

Term 1

Assignment

Activity 1.1

Total: 40 Marks

Name:

Date:

Time: 1 hour

Instructions:

- a) Write your name and date in the spaces provided.
- b) No calculators are allowed.
- c) Show calculations as requested on the question paper.
- d) The marks allocated are an indication of the number of steps per calculation.
- e) Check your answers.

Question 1: Circle the letter of the correct answer.

- 1.1. A girl can play 66 notes every minute. How many notes can she play in 6 minutes?



About 360 notes B. About 400 notes C About 500 notes D. About 380 notes

- 1.2. What do you get if you increase 316 by 500?

A. 800 B. 816 C. 316500 D. 516

- 1.3. What would result in the largest number?

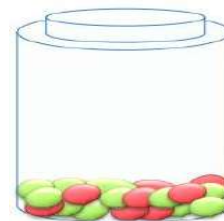
A. $7210 + 1345$ B. $1345 + 7245$ C. $1345 + 7210$ D. $1310 + 7245$

- 1.4. What is the missing number? $587 + ? = 630$

A. 33 B. 43 C. 50 D. 53

1.5. Anna bought 28 jellybeans. Which statement is **INCORRECT**?

- A. She can divide the beans equally into three groups
- B. She can divide the beans equally into groups of 7
- C. She can divide the beans equally into groups of 4
- D. She can divide the beans equally into two groups



[5 x 1 = 5]

Question 2: Answers the following questions:

2.1. Which number is represented by

$$(3 \times 10\,000) + (7 \times 1000) + (9 \times 100) + (8 \times 10) + (5 \times 1)$$

_____ (1)

2.2 Write the following number in digits.

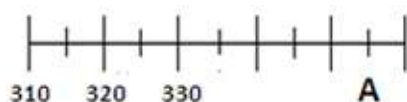
Six thousand one hundred and four.

_____ (1)

[2]

Question 3: Complete.

3.1 Which number is represented by the A on the following number line?



_____ (1)

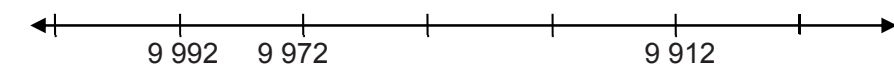
3.2. Calculate: $24\,367 \times 0 =$

_____ (1)

3.3 Round off 963 to the nearest 10.

_____ (1)

3.4. Complete the missing numbers



(2)

[4]

Question 4: Calculate

- 4.1 What is the next even number after 5 144? _____ (1)
- 4.2 What is the next odd number after 9 671? _____ (1)
- 4.3 Calculate the **difference in value** of the digits in the thousands and tens place values in the number 9 876.

_____ (3)

- 4.4 Subtract 600 from 3 000

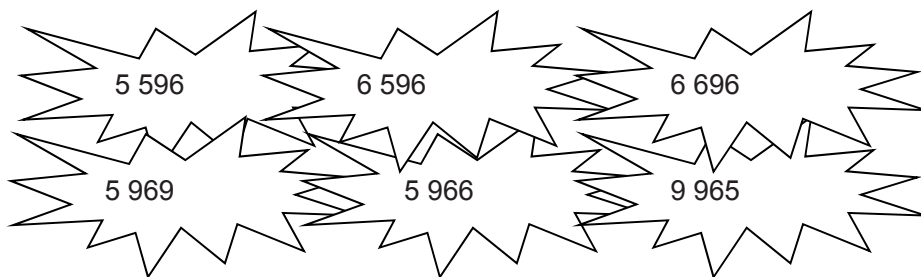
_____ (1)

- 4.5 Replace the $\square$ to make the sentence true: $135 - 7 + 7 = \square$

_____ (1)

[7]

Question 5: Arrange in ascending order.



_____ (1)

Question 6: Answer the following:

- 6.1 What is the place value of the underlined digit? 5 603

_____ (1)

- 6.2 State if the following number sentences are true or false. $302 - 123 = 123 - 302$

_____ (1)

- 6.3 Solve the number sentence. Show how you get the answer. $57 + 8 = \square + 5$

_____ (1)

6.4 Use one pair of brackets to make the number sentence true.

$$9 \times 10 - 8 = 18 \quad (1)$$

6.5 Write a number sentence for the following problem.

Alan scored 34 in the first test, 40 in the second and 16 in the third. What is the total he scored for the three tests?

_____ (1)

[5]

Question 7: Complete:

7.1 Multiples of 15: 15 ; 30 ; 45 ; _____ ; _____ ; _____

7.2 Multiples of 22: 22 ; 44 ; _____ ; 88 ; _____ ; _____

7.3 Factors of 99: 1 ; _____ ; 9 ; _____ ; _____ ; 99 [3 x 1 = 3]

Question 8: Calculate and show your workings.

8.1 $653 + 68 + 3\,912$ (4)

8.2 $4\,506 - 3\,605$ (3)

8.3 Check the answers by doing the inverse operation (2)

Question 9: Calculate

Thandi's mom travelled 4 456 km in 2012 and in 2013 she travelled 5 655 km.

9.1 In which year did she travel the furthest?

_____ (1)

9.2 What is the total distance she travelled in 2012 and 2013?

_____ (2)

9.3 How much further did she travel in 2013 compared to 2012?

_____ (1)

Question 10: Calculate

There were 8 450 spectators at the drumming finals. If 2 715 of the spectators were children, how many were adults.

_____ (1)

[5]

Total: 40 Marks

GRADE 5 ASSIGNMENT EXEMPLAR: MEMORANDUM

Mathematics

Term 1

Assignment

Time: 1 hour

Memorandum

General marking note:

- a) Give full marks for answers only, unless otherwise stated.
- b) Accept alternative mathematically correct solutions that are not included in the memorandum.
- c) CA refers to consistent accuracy.

Question		Expected answer	Explanation	Mark allocation	Total
1	1.1	B✓		1	5
	1.2	B✓		1	
	1.3	B✓		1	
	1.4	B✓		1	
	1.5	A✓		1	
2	2.1	37 985✓		1	2
	2.2	6 104✓		1	
3	3.1	355✓		1	5
	3.2	0✓		1	
	3.3	960✓		1	
	3.4	10 012; ✓9 952; 9 932; 9892✓		2	
4	4.1	5 146✓		1	7
	4.2	9 673✓		1	
	4.3	9 000✓ - 70✓ = 8 930✓	No marks if wrong digits were chosen	3	
	4.4	3 000 – 600 = 2 400✓		1	
	4.5	135✓		1	
5		5596; 5966; 5969; 6596; 6696; 9965✓	1 mark for all 6 numbers correct	1	1

6	6.1	Hundreds✓		1	5
	6.2	False✓		1	
	6.3	60✓		1	
	6.4	$9 \times (10 - 8) = 18$ ✓		1	
	6.5	$34 + 40 + 16 = \square$ ✓		1	
7	7.1	60; 75; 90✓	All 3 answers correct for 1 mark	1	1
	7.2	66; 110; 132✓	All 3 answers correct for 1 mark	1	1
	7.3	3; 11; 33✓	All 3 answers correct for 1 mark: any order	1	1
8	8.1	$ \begin{array}{r} 600 + 50 + 3 \checkmark \\ 60 + 8 \checkmark \\ + 3\,000 + 900 + 10 + 2 \checkmark \\ \hline 3\,000 + 1\,500 + 120 + 13 \\ = 4\,000 + 600 + 30 + 3 \\ = \underline{4\,633} \checkmark \end{array} $ or $ \begin{array}{r} 653 \\ 68 \\ + 3\,912 \checkmark \\ \hline 4\,633 \checkmark \checkmark \end{array} $	Apply CA	4	9
	8.2 and	$ \begin{array}{r} 4\,506 \\ \checkmark - 3\,605 \checkmark \\ 901 \checkmark \end{array} $	Apply CA	3 + 2	
	8.3	$ \begin{array}{r} 3\,605 \quad 901 \\ \checkmark + 901 \quad \checkmark + 3\,605 \\ 4\,506 \checkmark \text{ or } 4\,506 \checkmark \end{array} $			
9	9.1	2013✓		1	4
	9.2	10 111 km✓✓	Any method Unit must be indicated for full marks	2	

	9.3	1 199 km✓	Any method Unit must be indicated for full marks	1	
10		5 735✓	Any method	1	1
Bonus		7✓✓ If I move 7 coins from the fourth pile to the first pile, then the first pile includes $5 + 7 = 12$ coins. This is the largest number.		2	2
Total					40

5.3. Grade 6 assignment exemplar

Total: 40 Marks

Time: 1 hour

Name:

Date:

Instructions:

- a) Write your name and date in the spaces provided.
- b) No calculators are allowed.
- c) Show calculations as requested on the question paper.
- d) The marks allocated are an indication of the number of steps per calculation.

Question 1: Circle the letter of the correct answer

1.1 What is the sum of 200, 300, 150 and 250?

- A. 900 B. 1000 C. 850 D. 950

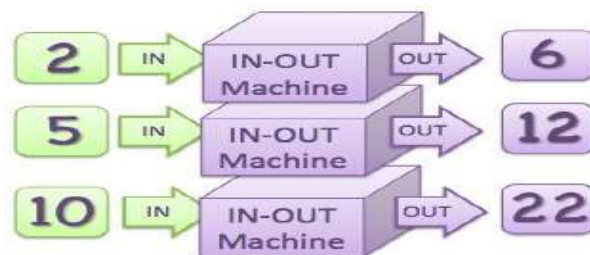
1.2 Mike bought 57 jellybeans. Which statement is **CORRECT**?

- A. He can divide the beans equally into 5 groups.
- B. He can divide the beans equally into 7 groups.
- C. He can divide the beans equally into 3 groups.
- D. He can divide the beans equally into 9 groups.



1.3 What rule is used for the In-Out machine? Remember, there may be more than one correct answer.

- A. Double the number and add 1
- B. Add 1 and double the result
- C. Add 2 and double the result
- D. Triple the number and add 1



1.4 What is the missing number?

- A. 4
- B. 5
- C. 6
- D. 8



$$[4 \times 1 = 4]$$

Question 2: Answer the following questions:

2.1 Write the number in digits.

Two hundred and eighty three thousand one hundred and sixty four.

_____ (1)

2.2 Complete.

$$5 + 4 \times 6 = \underline{\hspace{2cm}} \quad (1)$$

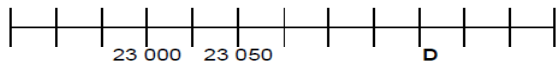
2.3 Which number is represented by

$$(4 \times 100\,000) + (30 \times 10\,000) + (900) + (7 \text{ tens}) + 5$$

2.4 Insert brackets in the following number sentence to make it true.

$$2 + 5 \times 9 - 4 = 27 \quad (1)$$

2.5 Which number is represented by the D on the following number line?



_____ (1)

2.6 $24\,367 \times 0 + 1 =$ _____ (1)

2.7 Round 35 963 off to the nearest 100.

_____ (1)
[8]

Question 3: Calculate:

3.1 Calculate the difference in value of the digits in the ten thousands and tens place values in the number 89 876.

_____ (3)

3.2 $3\,457 \times 10\,000$

_____ (1)

3.3 $7\,999 \div 6 \times 6 = \square$

(1)

3.4. List the prime numbers between 20 and 30.

(1)

[6]

Question 4: Fill in the correct symbol: < , > or = by replacing • sign.

4.1 $10\,648 \bullet 16\,480$ _____

4.2 $505\,000 \bullet 78\,700$ _____

[2 x 1 = 2]

Question 5: Study the table and answer the questions that follow.

5	6	7	9	12	15	16	17
20	25	32	39	44	68	72	88

5.1 Which numbers have 10 as a factor?

(1)

5.2 Which numbers are multiples of 11?

(1)

5.3 Which numbers are divisible by 9?

(1)

[3]

Question 6: Number sentences

6.1 Write a word problem for the number sentence below.

$3 \times \square = 27$

(1)

6.2 Solve the number sentence. Show how you get the answer. $28 + 8 \times 9 = \square + 5$

_____ (1)

6.3 Replace the $\square$ with the correct values to make the number sentence true.

$$43 + \square = 43$$

(1)

[3]

Question 7: Estimation

7.1 Estimate the answers by rounding off to the nearest 100.

$$1\,676 + 14\,234$$

(2)

7.2 Use estimation to find the answer by rounding off to the nearest 1 000

$$58\,621 - 34\,476$$

(2)

[4]

Question 8: Basic operations

8.1 Fill in the missing numbers in the expanded vertical addition of

$$65\,432 + 8\,581 + 34\,794.$$

$$\begin{array}{rcll} 65\,432 & = & 60\,000 + 5\,000 + 400 + \square + 2 \\ + 8\,581 & = & & + 8\,000 + \square + 80 + 1 \\ + 34\,794 & = & 30\,000 + 4\,000 + 700 + 90 + 4 \\ \hline \text{Total} & = & 90\,000 + 17\,000 + 1\,600 + 200 + 7 \\ & = & 90\,000 + 10\,000 + 7\,000 + 1\,000 + \square + 200 + 7 \\ & = & 100\,000 + \square + 800 + 7 \\ & = & 108\,807 \end{array}$$

(4 x 1 = 4)

8.2 Calculate and show your workings.

$$654 + 52\,235\,583 + 3\,912 \quad (3)$$

8.3.1 Calculate and show your workings.

$$394\,067 - 63\,605 \quad (2)$$

8.3.2 Check the answer by doing the inverse operation

(1)
[10]

TOTAL: 40 Marks

GRADE 6 ASSIGNMENT EXEMPLAR: MEMORANDUM

Mathematics

Assignment 1

Memorandum

Total: 40

General marking note:

1. Give full marks for answers only, unless otherwise stated.
2. Accept alternative mathematically correct solutions that are not included in the memorandum.
3. CA refers to consistent accuracy.

Question		Expected answer	Explanation	Mark allocation	Total
1	1.1	A✓		1	4
	1.2	C✓		1	
	1.3	B✓	Both answers for 1 mark	1	
	1.4	C✓		1	
2	2.1	283 164✓		1	8
	2.2	29✓		1	
	2.3	430 975✓		2	
	2.4	$2 + 5 \times (9 - 4) = 27$ ✓		1	
	2.5	23 150✓		1	
	2.6	1✓		1	
	2.7	36 000✓		1	
3	3.1	$80\,000 - 70 = 79\,930$ ✓	No marks if wrong digits were chosen	3	6
	3.2	34 570 000✓		1	
	3.3	7 999✓		1	
	3.4	23; 29✓	1 mark for both answers	1	
4	4.1	$>$ ✓		1	

	4.2	>✓		1	2
5	5.1	20✓		1	3
	5.2	44; 88✓	Both numbers get 1 marks	1	
	5.3	9; 72✓	Both numbers get 1 marks	1	
6	6.1	Open answer (A number multiplied by 3 equals 27)	Consider any correct word problem	1	3
	6.2	95✓		1	
	6.3	0✓		1	
7	7.1	1 700 + 14 200✓ = 15 900✓	Both estimated numbers must be correct	2	4
	7.2	60 000 – 30 000✓ = 30 000✓	Both estimated numbers must be correct	2	
8	8.1	$ \begin{aligned} 65\,432 &= 60\,000 + 5\,000 + 400 + \boxed{30} + 2 \\ + 8\,581 &= \quad + 8\,000 + \boxed{500} + 80 + 1 \\ + 34\,794 &= \underline{30\,000 + 4\,000 + 700 + 90 + 4} \\ \text{Total} &= \underline{90\,000 + 17\,000 + 1\,600 + 200 + 7} \\ &= 90\,000 + 10\,000 + 7\,000 + 1\,000 + \boxed{600} + 200 + 7 \\ &= 100\,000 + \boxed{8\,000} + 800 + 7 \\ &= 108\,807 \end{aligned} $		4	10
	8.2	240 149✓✓✓	Apply CA	3	
	8.3.1	330 462✓✓	Apply CA	2	
	8.3.2	330 462 + 63 605 = 394 067✓		1	
Bonus		8✓		1	1
Total					40

6. EXAMINATION

(a) Purpose of a mathematics examination

Examinations (and tests) are individualised assessment tasks and should be carefully designed to ensure that learners demonstrate their full potential in Mathematics content (knowledge and skills). The questions should be carefully spread to cater for different cognitive levels as contemplated in Chapter 4 of CAPS. Examinations and tests are predominantly assessed using a memorandum.

(b) Developing a mathematics examination

It is best practice to start by developing an examination framework before developing the actual examination. An example of an examination framework is provided for Grade 6 and the same approach can be adopted when developing an examination for any grade. The examination framework assists the examiner to carefully identify the important concepts and skills to be assessed as well as to spread the cognitive levels appropriately. The purposeful choices of concepts and skills as well as appropriate spread of the cognitive levels are the key ingredients of the balanced examination or test. In addition, the examination should be grade appropriate to ensure fairness.

In order to enable learners to easily acclimatise to taking an examination, especially learners who experience examination anxiety, start the examination with questions that are fairly easy and that require knowledge and routine procedures.

One of the seemingly easy but complicated questions to set is the multiple-choice questions. Very often poor or weak distractors which do not serve a meaningful purpose are included in the multiple-choice questions. In order to improve the quality of the multiple-choice questions the following elements should be considered:

- The actual question (also called **stem**) should:
 - specify what the question is asking for;
 - be clear and concise;
 - include common information rather than repeating it in the options;
 - be in a question format wherever possible;
 - be stated in positive form wherever possible (else negative wording should be emphasised in bold or by underlining)
- The options should:
 - be free from clues to the correct answer
 - have the distractors that are plausible and attractive to the learners. Distractors should be guided or informed by the common misconceptions. For instance when asked to simplify $a^3 \times a^2$ it is common that learners are likely to give a^6 instead of a^5 . Therefore a^6 could make a good distractor, which is informed by the common misconceptions and could be plausible for some learners.

- be of approximately the same length;
- have only one correct answer (also called the key);
- not be positioned in any particular pattern, especially the position of the correct answer (or **key**). For instance, if there are four possible answers in each of the ten multiple-choice questions, the correct answer (or key) should NOT always be the first option.

(c) Administering a mathematics examination

Since the examination is an individualised assessment, it is normally administered in a controlled environment. A controlled environment through invigilation assists Intermediate Phase learners to get used to the examination conditions and cope fairly well with the more stringent examination conditions in Grade 12.

The controlled environment/condition of the examination can be quite threatening to the majority of learners. In order to ensure that they get accustomed to these conditions, tests should be administered regularly in fairly similar conditions that resemble the examination conditions.

Assignments should be administered to prepare learners adequately before the examinations are administered.

6.1. Grade 4 examination exemplar

MARKS : 60

DURATION: $1\frac{1}{2}$ hours

This examination paper consists of 10 pages, including the cover page.

Instructions and information to the learner

1. Read the questions carefully.
2. Answer **ALL** the questions.
3. Write neatly and legibly.
4. Number your answers exactly as the questions are numbered.
5. Clearly show **ALL** the calculations, diagrams, graphs, etc. you have used in determining the answers.
6. No calculators may be used.
7. This question paper consists of **19** questions.
8. Diagrams are **NOT** drawn to scale.

Four possible answers are given in question **1.1 to 1.5** and only one is correct. Circle the letter of the correct answer.

Example

$$72 \div 8 =$$

- A 80
- B 72
- C 64
- D 9

If you circled **D**, you have chosen the correct answer

1.1 $79 \times 8 =$

- A 632
- B 623
- C 87
- D 71

1.2 What is the value of the underlined digit in 4 614?

- A 4 000
- B 400
- C 40
- D 4

1.3 Round 2 463 to the nearest 100.

- A 2 400
- B 2 460
- C 2 465
- D 2 500

1.4 What is the missing number?

$$9\,000 + \square + 50 + 7 = 9\,657$$

- A 700
- B 600
- C 60
- D 6

1.5 Complete the pattern. 60; 90; 120; ____.

- A 90
- B 120
- C 150
- D 180

2 Arrange the following numbers from biggest to smallest.

1 132; 1 184; 1 148; 1 125; 1 167; 1 138

3 Complete the following by inserting =, > or < in the space provided.

3.1 $20 + 25$ $50 - 5$

3.2 $\frac{1}{2}$ $\frac{1}{4}$

4 Calculate

4.1 $5\,362 + 2\,486$ (2)

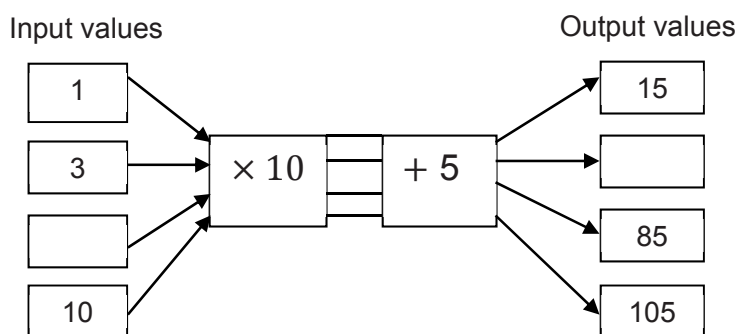
4.2 $4\,687 - 2\,143$ (2)

4.3 43×16 (2)

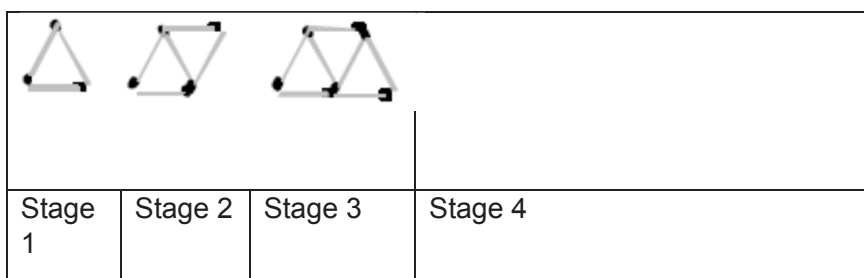
4.4 $432 \div 5$ (3)

4.5 $\frac{1}{4} + \frac{2}{4}$ (2)

5. Complete the pattern below. (2)



6 Match sticks are used to make triangles below.



6.1 Extend the pattern by drawing the triangles for stage 4. (1)

6.2 Complete the table below.

Number of triangles	1	2	3	4	(1)
Number of match sticks	3	5			

6.3 Write down a general rule for the pattern in words. (2)

7. In an orchard, one plot has 20 rows of orange trees. There are 25 trees in each row. How many orange trees are there altogether in two plots? (3)

8. Three pairs of sports socks and one school jersey cost a total of R95. The jersey costs R50. How much does one pair of sports socks cost? (3)

9. Chickens and sheep are kept in a pen. The total number of animals is 10. The total number of legs is 34. How many are chickens and how many are sheep? (3)

10. Write the time shown in the clock below in 12 hour format in the morning. (1)



- 11 How many quarter-hour turns of the minute hand are there between 1:00 p.m. and 3:00 p.m.? (1)

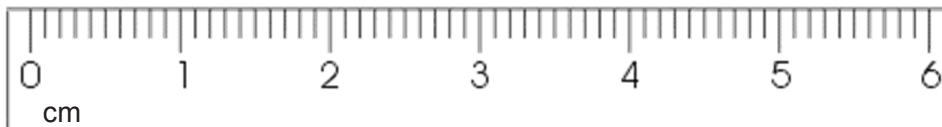
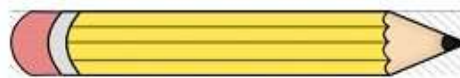
- 12 The table below shows the periods for a Grade 4 class on a Monday.
The duration of the periods does not change throughout the week.

Mon	Mathematics								
	FAL	Break	NS/Tech	HL	Break	SS	L/Skills	Afrikaans	
Times	08:00	09:00	10:00	10:30	11:30	12:30	12:50	13:50	14:50

- 12.1 How many minutes are in the two breaks altogether? (1)

- 12.2 Mathematics is taught each day. Two periods of Mathematics are taught on Tuesday. How many hours of Mathematics are taught in one week? (2)

13. How long is the lead pencil below in *mm*? (1)

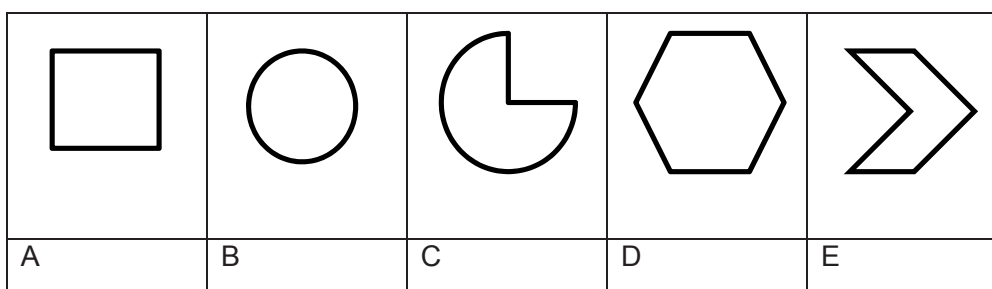


14. Convert the following

$2\text{ m } 48\text{ cm} = \underline{\hspace{2cm}}\text{ cm}$

15. Linda travels $3\text{ km } 500\text{ m}$ by bus from his home to school, and then he walks the rest of the distance to school. The total distance from his house to school is $4\text{ km } 300\text{ m}$. How far must he walk to school? (2)

16. Use the shapes below to answer the following questions.

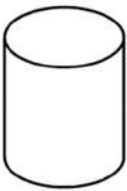
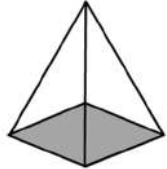


- 16.1 Write the letters of ALL the shapes that are polygons. (2)

16.2 Write the letters of ALL the shapes that are hexagons. (1)

16.3 Shape A is a square. How many lines of symmetry are there in shape A? (1)

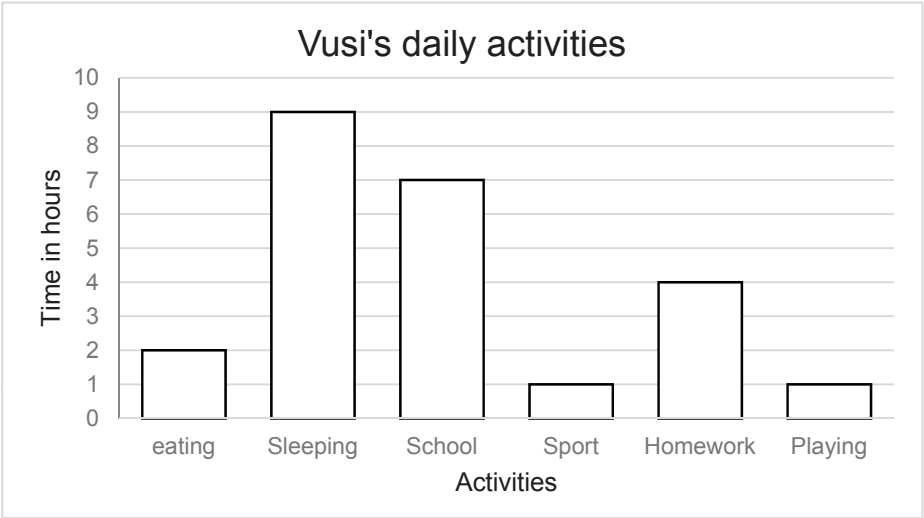
17 Complete the table below.

3-D object	Name	Shape of faces
	Cylinder	17.1 _____ and rectangles
	17.2 _____ _____	17.3 _____ and triangles

18 How many rectangles are there in the shape below? (2)



19. The bar graph below shows time spent in Vusi's daily activities



19.1 Use the bar graph to complete the table below.

Daily activity	Time spent
School	_____
Sleeping	_____

19.2 How many more hours does Vusi spend sleeping than eating? (2)

19.3 In which activities does Vusi spend equal hours? (1)

_____ and _____

19.4 How much time does Vusi spend on homework? (1)

Write your answer as a fraction.

TOTAL: 60 MARKS

GRADE 4 EXAMINATION EXEMPLAR: MEMORANDUM

MARKS: 60

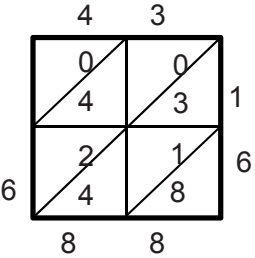
Important information

- This is marking guideline. In instances where learners have used different mathematically sound strategies to solve the problems, they should be credited.
- Underline errors committed by learners and apply Consistent Accuracy (CA) marking.

KEY	
M	Method mark.
CA	Consistent Accuracy mark.
A	Accuracy mark.
S	Statement.
R	Reason.
S/R	Statement and reason.

1.1.	A ✓	632	1 mark for each correct answer
1.2	A ✓	4 000	
1.3	D ✓	2 500	
1.4	B ✓	600	
1.5	C ✓	150	

Ques	Answer	Mark allocation	Total
2	1 184; 1 167; 1 148; 1 138; 1 132; 1 125 ✓ A	Answer: 1 mark	1
3.1	$20 + 25 = 50 - 5$ ✓ A	Answer: 1 mark	1
3.2	$\frac{1}{2} > \frac{1}{4}$ ✓ A	Answer: 1 mark	1

4.1	$5\,362 + 2\,486$ $5\,000 + 2\,000 = 7\,000$ $300 + 400 = 700 \checkmark M$ $60 + 80 = 140$ $2 + 6 = \underline{8}$ $\underline{7\,848} \checkmark A$ Or $5\,362 + 2\,000 \longrightarrow 7\,362 + 400 \longrightarrow 7\,762 + 40 \longrightarrow 7\,802 + 40 \longrightarrow 7\,842 + 6 \longrightarrow 7\,848 \checkmark A$	Any method: 1 mark Answer: 1 mark	2
4.2	$4\,687 - 2\,143$ $4\,000 - 2\,000 = 2\,000$ $600 - 100 = 500$ $80 - 40 = 40 \checkmark$ $7 - 3 = \underline{2}$ $\underline{2\,544} \checkmark$ Or $4\,687 - 2\,000 \longrightarrow 2\,687 - 100 \longrightarrow 2\,587 - 40 \longrightarrow 2\,547 - 3 \longrightarrow 2\,544 \checkmark A$	Any method: 1 mark Answer: 1 mark	2
4.3	43×16 $40 \times 10 = 400 \checkmark M$ $40 \times 6 = 240$ $3 \times 10 = 30$ $3 \times 6 = \underline{18}$ $\underline{= 688} \checkmark A$ Or  $= 688 \checkmark A$	Any method: 1 mark Answer: 1 mark	2

4.4	432 ÷ 5 400 ÷ 5 = 80 (432 – 400 = 32) ✓ M 30 ÷ 5 = 6 (32 – 30 = 2) ✓ A = 86 remainder 2 ✓ A Or 50 + 25 + 10 + 1 432 –250 =182 182 –125 = 57 57 –50 = 7 7 –5 = 2 ✓ A 432 ÷ 5 = 86 rem ✓ A	Any method: 1 mark 86: 1 mark Rem 2: 1 mark Clue board 5 × 100 = 500 5 × 50 = 250 5 × 25 = 125 5 × 10 = 50 5 × 5 = 25 5 × 2 = 10 5 × 1 = 5	3										
4.5	1 4 + 2 4 = 3 4 ✓ A ✓ A	3: 1 mark 4: 1 mark											
5	Input values 1 3 8 ✓ 10 × 10 + 5 Output values 15 35 ✓ 85 105	Correct output : 1 mark Correct input : 1 mark	2										
6.1		Answer: 1 mark	1										
6.2	<table><tr><td>Stage no.</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Number of match sticks</td><td>3</td><td>5</td><td>7 ✓ A</td><td>9 ✓ A</td></tr></table>	Stage no.	1	2	3	4	Number of match sticks	3	5	7 ✓ A	9 ✓ A		2
Stage no.	1	2	3	4									
Number of match sticks	3	5	7 ✓ A	9 ✓ A									
6.3	✓ A ✓ A Multiply the stage number by 2 and add 1 Or Add 2 to the number of match sticks in each stage to get the next stage	Stage number × 2: 1 mark + 1: 1 mark	2										
7	✓ M ✓ M	20 × 25 × 2 : 2 marks Answer: 1 mark	3										

	$20 \times 25 \times 2$ $=1000$ trees ✓ A Or $20 \times 25 = 500$ ✓ A ✓ M ✓ A $500 \times 2 = 1000$																																
8	$R95 - R50 = R45$ ✓ A ✓ M $R45 \div 3 = R15$ ✓ C A	Or 500: 1 mark 500×2: 1 mark Answer: 1 mark R 45: 1 mark $R 45 \div 3$: 1 mark Answer: 1 mark	3																														
9	          ✓ A ✓ A There are 7 sheep and 3 chickens Or ✓ M <table><tr><th colspan="2">Heads</th><th colspan="2">Legs</th><th>Total</th></tr><tr><th>Sheep</th><th>Chks</th><th>Sheep</th><th>Chks</th><th>Legs</th></tr><tr><td>5</td><td>5</td><td>20</td><td>10</td><td>30</td></tr><tr><td>4</td><td>6</td><td>16</td><td>12</td><td>28</td></tr><tr><td>6</td><td>4</td><td>24</td><td>8</td><td>32</td></tr><tr><td>7</td><td>3</td><td>28</td><td>6</td><td>34</td></tr></table> ✓ A ✓ A There are 7 sheep and 3 chickens	Heads		Legs		Total	Sheep	Chks	Sheep	Chks	Legs	5	5	20	10	30	4	6	16	12	28	6	4	24	8	32	7	3	28	6	34	Any method: 1 mark 7 sheep: 1 mark 3 chickens: 1 mark	3
Heads		Legs		Total																													
Sheep	Chks	Sheep	Chks	Legs																													
5	5	20	10	30																													
4	6	16	12	28																													
6	4	24	8	32																													
7	3	28	6	34																													

10	1:15 a.m. ✓ A	Answer: 1 mark	1
11	8 ✓ A	Answer: 1 mark	1
12.1	50 minutes ✓ A ✓ A	Answer: 1 mark	2
12.2	1 period = 1 hour Maths = 6 hours ✓ A	1 hour: 1 mark Answer: 1 mark	1
13	30 mm ✓ A	Answer: 1 mark	1
14	200 cm + 48 cm = 248 cm ✓ A	Answer: 1 mark	1
15	4 km 300 m – 3 km 500m = 1 300 m – 500 m ✓ M = 800 m ✓ A	Method: 1 mark Answer: 1 mark	2
16.1	A, D and E ✓ A ✓ A	Any 2 correct: 1 mark All 3 correct: 2 marks	2
16.2	D and E ✓ A	Both letters: 1 mark	1
16.3	4 lines of symmetry ✓ A	Answer: 1 mark	1
17.1	Circle ✓ A	Answer: 1 mark	1
17.2	Square pyramid ✓ A	Answer: 1 mark	1
17.3	Square ✓ A	Answer: 1 mark	1
18	6 ✓ A	Answer: 1 mark	1
19.1	School 7 hours ✓ A Sleeping 9 hours ✓ A	Answer: 1 mark	2
19.2	2 hours eating. 9 – 2 = 7 hours more sleeping than eating	9 – 2 one mark Answer: 1 mark	2
19.3	Sport and playing ✓ A	1 mark for both	1
19.4	$\frac{4}{24} = \frac{1}{6}$ ✓ A	$\frac{4}{24}$ or $\frac{1}{6}$: 1 mark	1

6.2. Grade 5 examination exemplar

MARKS : 60

DURATION: $1\frac{1}{2}$ hours

This examination paper consists of 11 pages, including the cover page.

Instructions and information to the learner

1. Read the questions carefully.
2. Answer **ALL** the questions.
3. Write neatly and legibly.
4. Number your answers exactly as the questions are numbered.
5. Clearly show **ALL** the calculations, diagrams, graphs, etc. you have used in determining the answers.
6. No calculators may be used.
7. This question paper consists of **19** questions.
8. Diagrams are **NOT** drawn to scale.

There are FOUR possible answers given in question **1.1 to 1.5** and only one is correct. Circle the letter of the correct answer as shown in the example below.

Example

Complete: $72 \div 8 = \underline{\hspace{1cm}}$.

- A 80
- B 72
- C 64
- D 9

If you circled **D**, you have chosen the correct answer

1.1 What is the value of the underlined digit in 712 395? (1)

- A 20 000
- B 2 000
- C 200
- D 2

1.2 How many lines of symmetry does a square have? (1)

- A 2
- B 3
- C 4
- D 1

1.3 The next number in the pattern 32; 16; 8; ... is _____. (1)

- A 6
- B 4
- C 2
- D 1

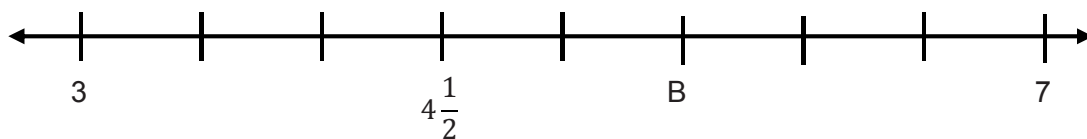
1.4 There are _____ months in $\frac{2}{3}$ of a year. (1)

- A. 12
 - B. 8
 - C. 6
 - D. 4
- (1)

1.5 Write down the sum of 36 hundreds + 36 tens + 36 units.

- A 363 636
- B 36 396
- C 3 996
- D 3 936

2.1 Write the missing number indicated by letter B in the number line (1)



B _____

2.2 Arrange the numbers below in ascending order (1)

24 555, 24 335, 24 533, 24 535, 24 545

3 Compare the following by inserting > ; < ; = , in the spaces provided.

3.1 $\frac{1}{4}$ $\frac{2}{8}$ (1)

3.2 $\frac{3}{5}$ $\frac{5}{5}$ (1)

4 Calculate:

4.1 $(3 + 8) \times (9 - 4)$ (2)

4.2. $25\,583 + 28\,654$ (2)

4.3 475×34 (3)

4.4 $1\,847 \div 12$ (3)

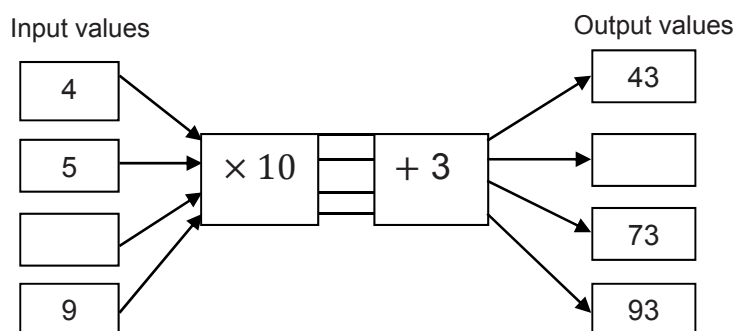
4.5 $2\frac{1}{6} - 1\frac{5}{6}$ (3)

5 Five books and one bag cost R350. How much does one book cost, if the bag costs R100? (3)

- 6 There are 10 bicycles and tricycles altogether with a total 24 of wheels. How many are bicycles and how many are tricycles? (4)

- 7 John is working 7 hours a day from Monday to Friday. How many minutes does he work in 2 weeks? (2)

- 8 Fill in the missing input and output values in the flow diagram below. (2)



- 9 The diagrams below show the number of people sitting around the table(s). Study and answer the questions that follow.

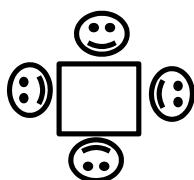


Figure 1

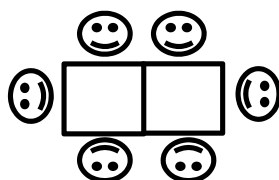


Figure 2

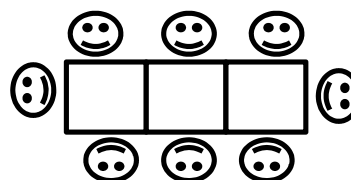


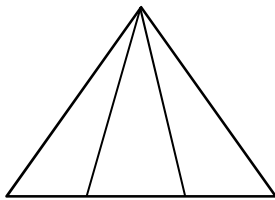
Figure 3

- 9.1 Complete the table below to illustrate the number of people sitting around the table(s). (2)

Number of tables	1	2	3	4		10
Number of people	4	6	8	—		—

- 9.2 Describe the general rule for the above pattern in words. (2)

- 10 How many different triangles are there in the shape below?



- 11 Write down one similarity and one difference between a square and a rectangle. (2)

Square	Rectangle
	

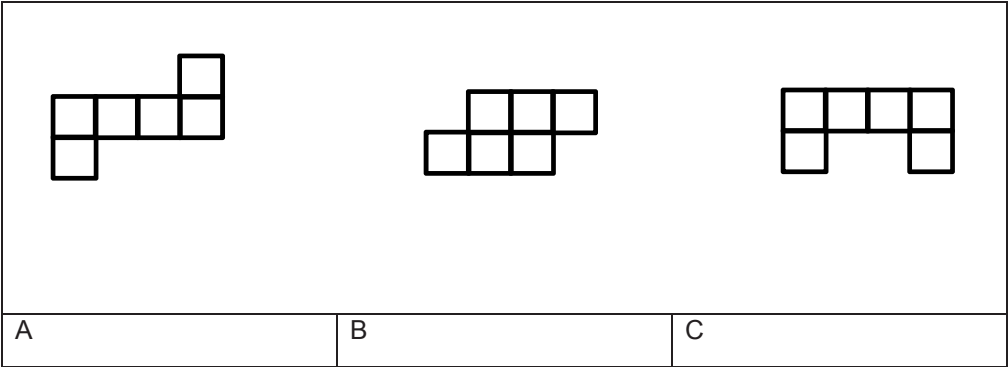
Similarity	Difference
_____	_____
_____	_____
_____	_____

12 Complete the table about the 3-D object below

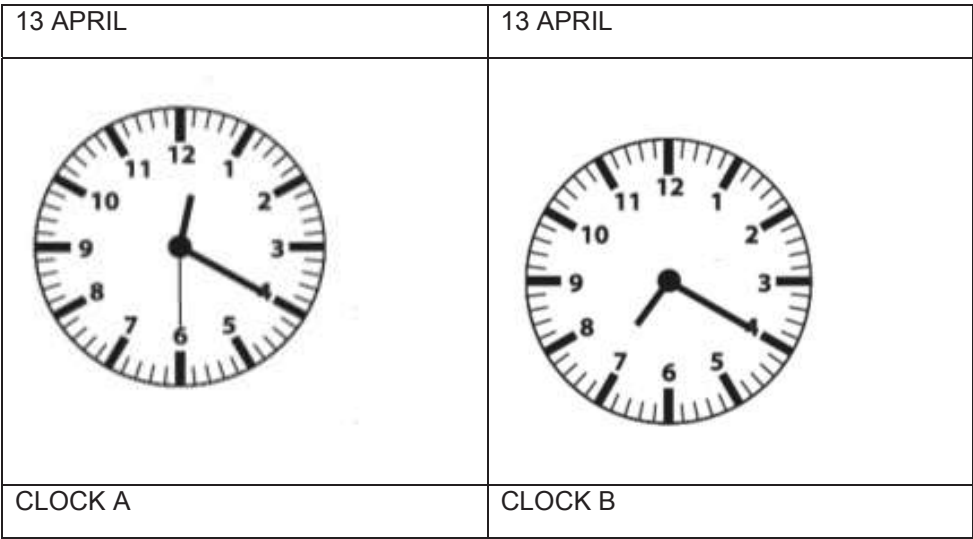
(4)

	
Name of the object	12.1 _____
Shape of the faces	12.2 _____ and _____
Number of faces	12.3 _____

13 Which of the following nets can be folded to make a closed cube (1)



14 The clocks below were read in the afternoon.



14.1 What is the time in clock A in 12 hour format? (1)

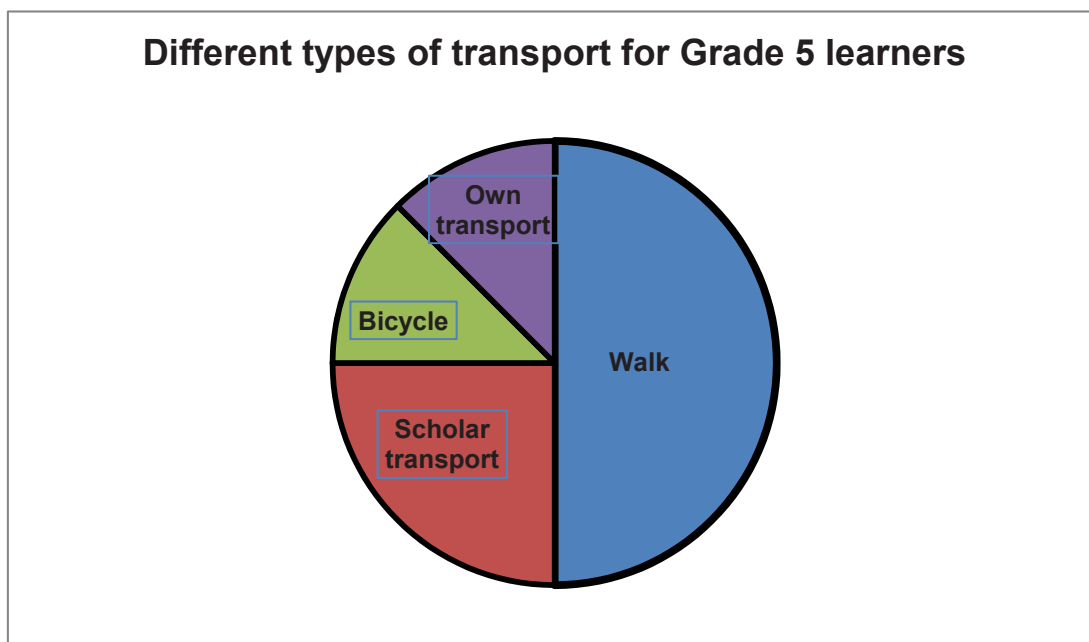
14.2 What is the time in clock B in 24 hour format? (1)

14.3 What is the time difference between the two clocks, in minutes? (1)

15 Which one is cheaper, 2 ℓ juice for R20 or 5 ℓ juice for R60? (3)

16 How many 250 ml cups of orange juice can fill up a 5 ℓ container? (2)

- 17 The pie chart below shows the number of Grade 5 learners who use different types of transport to school. There are 40 learners in the Grade 5 class. N.B. The pie chart is divided into 8 equal parts.



- 17.1 What fraction of the Grade 5 learners walk to school? (2)

- 17.2 How many learners use bicycles? (1)

- 17.3 How many learners use scholar transport? (1)

18 The following data show the marks scored by Grade 5 learners in a Mathematics test

32	25	30
30	40	32
31	30	30

18.1 How many learners wrote the test? (1)

18.2 What is the mode of the data? (1)

TOTAL MARK: 60

GRADE 5 EXAMINATION EXEMPLAR: MEMORANDUM

MARKS: 60

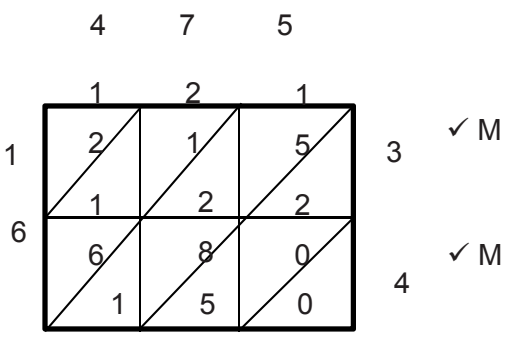
This memorandum consists of five pages

Important information

- This is a marking guideline. In instances where learners have used different mathematically sound strategies to solve the problems, they should be credited.
- Underline errors committed by learners and apply Consistent Accuracy (CA) marking.

KEY	
M	Method mark.
CA	Consistent Accuracy mark.
A	Accuracy mark.
S	Statement.
R	Reason.
S/R	Statement and reason.

1.1.	B ✓	2 000	1 mark for each correct answer
1.2	C ✓	4	
1.3	B ✓	4	
1.4	B ✓	8	
1.5	C ✓	36 996	
Ques	Answer	Mark allocation	Total
2.1	$5\frac{1}{2}$ ✓ A	Answer: 1 mark	1
2.2	24 335; 24 533; 24 535; 24 545; 24 555 ✓ A	Answer: 1 mark	1
3.1	$\frac{1}{4} = \frac{2}{8}$ ✓ A	Answer: 1 mark	1
3.2	$\frac{3}{5} < \frac{5}{5}$ ✓ A	Answer: 1 mark	1
4.1	$(3 + 8) \times (9 - 4)$ ✓ M 11×5 ✓ A 55	11×5 : 1 mark Answer: 1 mark	2

4.1	$25\,583 + 28\,654$ $20\,000 + 20\,000 = 40\,000$ $5\,000 + 8\,000 = 13\,000$ $500 + 600 = 1\,100 \checkmark M$ $80 + 50 = 130$ $3 + 4 = \underline{\quad 7 \quad}$ $\underline{54\,237} \checkmark A$ Or $25\,583 + 20\,000 \longrightarrow 45\,583 + 5\,000 \longrightarrow \checkmark M$ $50\,583 + 3\,000 \longrightarrow 53\,583 + 500 \longrightarrow$ $54\,083 + 100 \longrightarrow 54\,183 + 20 \longrightarrow$ $54\,203 + 30 \longrightarrow 54\,233 + 4 \longrightarrow 54\,237 \checkmark A$	Any method: 1 mark Answer: 1 mark	2
4.3	475×34 $400 \times 10 \times 3 = 12\,000 \checkmark M$ $70 \times 10 \times 3 = 2\,100$ $5 \times 10 \times 3 = 150$ $400 \times 4 = 1\,600 \checkmark M$ $70 \times 4 = 280$ $\underline{5 \times 4 = 20} \checkmark A$ $\underline{16\,150}$ Or  $= 16\,150 \checkmark A$	Any method: 2 marks Answer: 1 mark	3

4.4	$1\ 847 \div 12$ $1200 \div 12 = 100$ ($1847 - 1200 = 647$) ✓ M $600 \div 12 = 50$ ($647 - 600 = 47$) $36 \div 12 = 3$ ($47 - 36 = 11$) ✓ A = 153 remainder 11 ✓ A Or <table border="1"> <tr> <td>100</td><td>+ 50</td><td>+ 2</td><td>+ 1</td></tr> <tr> <td>1 847</td><td>647</td><td>47</td><td>23</td></tr> <tr> <td>$\times 12$ -1 200</td><td>-600</td><td>-24</td><td>-12</td></tr> <tr> <td>=647</td><td>= 47</td><td>= 23</td><td>= 11</td></tr> </table> ✓ A $1\ 847 \div 12 = 153 \text{ rem } 11$ ✓ A	100	+ 50	+ 2	+ 1	1 847	647	47	23	$\times 12$ -1 200	-600	-24	-12	=647	= 47	= 23	= 11	Any method: 1 mark 153: 1 mark Rem 11: 1 mark Clue board $12 \times 100 = 1\ 200$ $12 \times 50 = 600$ $12 \times 10 = 120$ $12 \times 20 = 240$ $12 \times 2 = 24$ $12 \times 1 = 12$	3
100	+ 50	+ 2	+ 1																
1 847	647	47	23																
$\times 12$ -1 200	-600	-24	-12																
=647	= 47	= 23	= 11																
4.5	$2\frac{1}{6} - 1\frac{5}{6}$ $2 - 1 + \frac{1}{6} - \frac{5}{6}$ ✓ M $\frac{6}{6} + \frac{1}{6} - \frac{5}{6}$ $\frac{7}{6} - \frac{5}{6}$ ✓ A $\frac{1}{6}$ ✓ CA $\frac{2}{6} = \frac{1}{3}$	2-1: 1 mark $\frac{7}{6}$: 1 mark Answer: 1 mark	3																
5	$R350 - R100 = R250$ ✓ A ✓ M $R250 \div 5 = R50$ ✓ C A	R250: 1 mark $R\ 250 \div 5$: 1 mark Answer: 1 mark	3																

6	✓ M ✓ M <table><tr><td>Cyclists</td><td colspan="2"></td><td colspan="2">Wheels</td><td>total</td></tr><tr><td></td><td>B</td><td>T</td><td>B</td><td>T</td><td>Legs</td></tr><tr><td>10</td><td>5</td><td>5</td><td>10</td><td>15</td><td>25</td></tr><tr><td></td><td>6</td><td>4</td><td>12</td><td>12</td><td>24</td></tr></table> ✓ A ✓ A There are 6 bicycles and 4 tricycles	Cyclists			Wheels		total		B	T	B	T	Legs	10	5	5	10	15	25		6	4	12	12	24	Any method: 2 marks 6 bicycles: 1 mark 4 tricycles: 1 mark	4
Cyclists			Wheels		total																						
	B	T	B	T	Legs																						
10	5	5	10	15	25																						
	6	4	12	12	24																						
7	✓ ✓ M $(7 \times 5 \times 60) \times 2$ = 4 200 mins. ✓ A Or ✓ A $7 \times 5 = 35$ ✓ M ✓ A $(35 \times 60) \times 2 = 4\ 200$	$7 \times 5 \times 60 \times 2$: 2 marks Answer: 1 mark Or 35: 1 mark $35 \times 60 \times 2$: 1 mark Answer: 1 mark	(3)																								
8	Input values <table><tr><td>4</td><td rowspan="4">→ × 10 → → →</td><td rowspan="4">→ → → →</td><td rowspan="4">→ → → →</td><td rowspan="4">→ → → →</td><td rowspan="4">→ → → →</td></tr><tr><td>5</td></tr><tr><td>7 ✓</td></tr><tr><td>9</td></tr></table> Output values <table><tr><td>43</td></tr><tr><td>53</td></tr><tr><td>73 ✓</td></tr><tr><td>93</td></tr></table>	4	→ × 10 → → →	→ → → →	→ → → →	→ → → →	→ → → →	5	7 ✓	9	43	53	73 ✓	93	Correct output: 1 mark Correct input: 1 mark	2											
4	→ × 10 → → →	→ → → →						→ → → →	→ → → →	→ → → →																	
5																											
7 ✓																											
9																											
43																											
53																											
73 ✓																											
93																											

9.1	<table><tr><td>Number of tables</td><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td>10</td></tr><tr><td>Number of people</td><td>4</td><td>6</td><td>8</td><td>10</td><td>✓ A</td><td>22</td><td>✓ A</td></tr></table>							Number of tables	1	2	3	4		10	Number of people	4	6	8	10	✓ A	22	✓ A	2
Number of tables	1	2	3	4		10																	
Number of people	4	6	8	10	✓ A	22	✓ A																
9.2	✓ A ✓ A Multiply by 2 and add 2				× 2: 1 mark + 2: 1 mark			2															
10	3+2+1= 6 ✓ A ✓ A ✓ M				Between 3 and 6: 1 mark Answer: 2 marks			2															
11	<table><tr><td>Similarity</td><td>Difference</td></tr><tr><td>Both have right angles ✓ A</td><td>A square has all sides equal and a rectangle has both pairs of opposite sides equal ✓ A</td></tr></table>							Similarity	Difference	Both have right angles ✓ A	A square has all sides equal and a rectangle has both pairs of opposite sides equal ✓ A	2											
Similarity	Difference																						
Both have right angles ✓ A	A square has all sides equal and a rectangle has both pairs of opposite sides equal ✓ A																						
12.1	Hexagonal pyramid ✓ A				Answer: 1 mark			1															
12.2	Hexagon ✓ A and triangles ✓ A				Hexagon: 1 mark Triangles: 1 mark			2															
12.3	7 ✓ A				Answer: 1 mark			1															
13	A ✓ A				Answer: 1 mark			1															
14.1	12:20 p.m. ✓ A				Answer: 1 mark			1															
14.2	19:20 ✓ A				Answer: 1 mark			1															

14.3	$7 \times 60 = 420$ minutes ✓ A ✓ A	Answer: 1 mark	1
15	$\frac{20}{2} = R10/l$ or $\frac{60}{5} = R12/l$ 2 ℓ juice for R60 is cheaper ✓ A	R15/ ℓ: 1 mark R12/ ℓ: 1 mark Answer: 1 mark	3
16	$5000 \text{ m } \ell \div 250 \text{ m } \ell$ ✓ M = 20 ✓ A Or $1000 \text{ m } \ell \div 250 \text{ m } \ell = 4$ ✓ M $4 \times 5 = 20$ ✓ A	$5000 \text{ m } \ell \div 250 \text{ m } \ell$: 1 mark Answer: 1 mark Or $1000 \text{ m } \ell \div 250 \text{ m } \ell = 4$: 1 mark $4 \times 5 = 20$: 1 mark	2
17.1	$\frac{1}{2}$ ✓ A	Answer: 2 marks	1
17.2	$\frac{1}{8} \times 40$ ✓ M = 5 ✓ A	$\frac{1}{8} \times 40$: 1 mark Answer: 1 mark	2
17.3	$\frac{1}{8} \times 40 = 5$ ✓ A ✓ A	Answer: 1 mark	1
18.1	9	Answer: 1 mark	1
18.2	30 ✓ A	Answer: 1 mark	1

6.3. Grade 6 examination (framework)

Test Specifications

KEY	
K:	Knowing facts and procedures
RP:	Routine Procedures
CP:	Complex procedures
PS:	Problem solving
MCQ:	Multiple-choice question
CR:	Constructive Response

Item Number	Content Area	Topics	Concepts and skills	Cognitive Level	Type of item (MCQ/CR)	Max Score
1.1	Numbers, operations and relationships	Whole numbers	Place value of whole numbers	K	MCQ	1
1.2			Identifying prime numbers	K	MCQ	1
1.3		Decimal fractions	Recognising the place value of decimal numbers to at least 2 decimal places	K	MCQ	1
1.4	Space and shape	Symmetry	Identifying the lines of symmetry in 2-D shapes	K	MCQ	1
1.5	Patterns, functions and algebra	Numeric patterns	Investigating and extending a numeric pattern	R	MCQ	1
1.6	Space and shapes	Properties of polygons	Properties of 2-D shapes	K	MCQ	1
1.7	Numbers, operations and relationships	Decimal fractions	Multiplying a decimal by 100	K	MCQ	1
1.8		Whole numbers	Finding a number halfway between two whole numbers	CP	MCQ	1
1.9		Common fractions	Recognising equivalence between decimal fraction and percentage forms of the same number	K	MCQ	1
1.10	Measurements	Capacity/volume	Solve problems in context involving capacity	RP	MCQ	1
2.1	Numbers, operations and relationships		Counting forward and backwards in decimals on a number line	CP	CR	1
2.2		Whole numbers	Ordering 5-digit numbers	RP	CR	1

3.1	Numbers, operations and relationships	Common fractions	Recognising equivalence between common fraction and percentage forms of the same number	K	CR	1
3.2			Comparing common fractions	CP	CR	1
4.1		Whole numbers	Multiple operations on whole numbers with or without brackets	RP	CR	2
4.2		Addition of whole numbers	Addition of whole numbers to at least 5-digit numbers	RP	CR	2
4.3		Subtraction of whole numbers	Subtraction of whole numbers to at least 5-digit numbers	RP	CR	2
4.4		Whole numbers	Multiplication of at least whole 4 by 3 digits	RP	CR	3
4.5		Whole numbers	Addition and subtraction of decimal fractions with at least two decimal places	RP	CR	3
4.6		Mixed numbers	Division of at least whole 4-digit by 3-digit numbers	RP	CR	3
4.7		Decimal fractions	Addition of mixed numbers	RP	CR	2
5		Problem solving with whole numbers	Solve problems involving whole numbers including financial context	CP	CR	3
6		Problem solving with whole numbers	Solve problems involving whole numbers including rate	CP	CR	3
7		Problem solving with whole numbers	Solving non-routine unseen problems	PS	CR	4
8	Measurement	Time	Solving problems in context involving time		CR	2

9	Patterns, functions and algebra	Numeric patterns	Determining the input and output values for patterns and relationships in flow diagram given a rule	RP	CR	2
10.1		Geometric patterns	Investigating and extending geometric patterns, looking for relationships or rules of patterns represented in tables	RP	CR	3
10.2	Patterns, functions and algebra	Geometric patterns	Describing the general rule for the observed relationships in own words	CP	CR	2
10.3			Determining the equivalence of different descriptions of the same relationships or rule presented by a number sentence	K	CR	1
11	Space and shape	Properties of 2-D shapes	Recognising 2-D shapes in geometric settings, focusing on similarities and differences between a parallelogram and a rectangle.	K	CR	2
12			Solving unseen non-routine problems by identifying the number of rectangles within a rectangle	PS	CR	2
13		Properties of 3-D objects	Recognising, naming and describing 3-D objects in terms of number and shape of faces, number of vertices and number of edges	K	CR	4
14.1			Making 3-D models using nets – recognising a net of a cube	K	CR	1

14.2			Making 3-D models using nets – recognising a net of a square pyramid	K	CR	1
15	Measurement	Time	Reading time and calculating time differences	CP	CR	2
16		Capacity /volume	Solving problems in context involving capacity/volume	RP	CR	2
17			Problem solving in context involving volume/volume	CP	CR	2
18.1	Data handling	Analysing, interpreting and reporting data represented in pie chart	Interpreting data	K	CR	2
18.2				K	CR	1
18.3				RP	CR	2
18.4				K	CR	1
19.1		Analysing, interpreting and reporting data	Determine the mode of ungrouped numeric data	RP	CR	1
19.2			Determine the median of ungrouped numeric data	RP	CR	1

Summary: Content Area

Content Area	Number of items	Actual Total Marks	Proportion (%) of total test mark (Weighting)
Numbers, operations and relationship	21	38	51%
Patterns, functions and algebra	5	9	12%
Space and shape	6	12	16%
Measurement	4	8	10%
Data handling	6	8	10%
Total	42	75 marks	100%

Summary: Cognitive Levels

Cognitive Level	Number of items	Actual Total marks	Proportion (%) of total test mark (Weighting)
Knowledge (25%)	15	21	28%
Routine procedures (45%)	17	33	44%
Complex procedures (20%)	8	15	20%
Problem solving (10%)	2	6	8%
Grand Total	42	75	100%

Summary: Type of item

Type of item	Number of items	Total marks	Proportion (%) of total test mark (Weighting)
MCQ	10	10	13%
CR	32	65	87%
Grand Total	41	75	100%

GRADE 6 EXAMINATION EXEMPLAR

MARKS: 75

DURATION : $1\frac{1}{2}$ hours

This examination paper consists of 13 pages, including the cover page.

Instructions and information to the learner

1. Read the questions carefully.
2. Answer **ALL** the questions.
3. Write neatly and legibly.
4. Number your answers exactly as the questions are numbered.
5. Clearly show **ALL** the calculations, diagrams, graphs, etc. you have used in determining the answers.
6. No calculators may be used.
7. This question paper consists of **19** questions.
8. Diagrams are **NOT** drawn to scale.

There are FOUR possible answers given in question **1.1 to 1.10** and only one is correct. Circle the letter of the correct answer.

Example

Complete: $400 \times 7 = \underline{\hspace{2cm}}$.

- A 4 800
- B 1 100
- C 2 800
- D 7 000

If you circled **C**, you would have chosen the correct answer

1.1 What is the place value of the underlined digit in 584 289 732? (1)

- A Ten thousand
- B Hundred thousand
- C Hundred million
- D Ten million

1.2 Which number is a prime number? (1)

- A 25
- B 27
- C 14
- D 11

1.3 What is the value of the underlined digit in 153,25 (1)

A 0,02

B 0,2

C 20

D 2

1.4 Which one of the following figures has more than one line of symmetry? (1)



1.5 What are the two missing numbers in the pattern below? (1)

1; 2; 4; ____; ____; 32

A 6; 8

B 6; 16

C 8; 24

D 8; 16

1.6 How many sides does a quadrilateral have?

A. 3

B. 4

C. 5

D. 6

(1)

1.7 What is the product of 1,63 and 100?

- A. 163
B. 1 630
C. 16,3
D. 0,163 (1)

1.8 Which number is halfway between 5 900 and 6 500?

- A 12 400
B 7 000
C 6 200
D 6 000

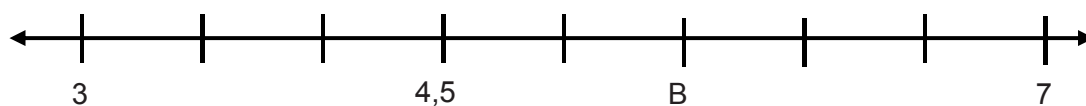
1.9 Which percentage has the same value as 0,25?

- A. 0,25%
B. 2,5%
C. 5,2%
D. 25%

1.10 How many glasses of water can a bottle with a capacity of 2 ℓ hold if one glass has a capacity of 250 ml?

- A. 500
B. 125
C. 8
D. 4

2.1 Write the missing number indicated by letter B in the number line (1)



B _____

2.2 Arrange the numbers below in ascending order (1)

918 143; 189 243; 891 123; 198 123

3 Compare the following by inserting > ; < or = , in the spaces provided.

3.1 100% 1 (1)

3.2 $\frac{1}{2}$ $\frac{2}{3}$ (1)

4 Calculate:

4.1 $(3 + 7) \div 2 + 3 \times 5 - 3 \div 3$ (2)

4.2. $25\,583 + 8\,654 + 2\,910$ (2)

4.3 $93\,056 - 63\,625$ (2)

4.4 $2\,058 \times 268$ (3)

4.5 $3,54 + 2,83$ (2)

4.6 $8\,648 \div 475$ (3)

4.7 $3\frac{3}{10} - 2\frac{2}{5}$ (3)

- 5 Pat wants to buy a hockey stick that costs R400. Her mother gave her 75% of the total cost. How much does she still need in rands? (3)

- 6 The cost of 10 text books for Grade 6 Mathematics is R1 200. How much will 15 textbooks of the same kind cost? (3)

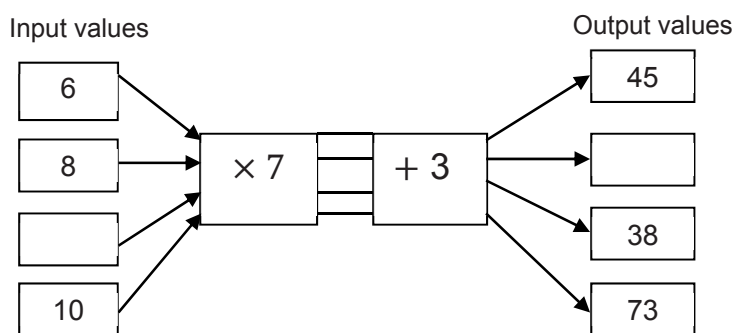
- 7 Each picture below represents a number. By adding the numbers, you will find the totals in the boxes. Calculate the rest of the totals and fill in the empty boxes. (4)

Key: shell = 4; Flower = 2

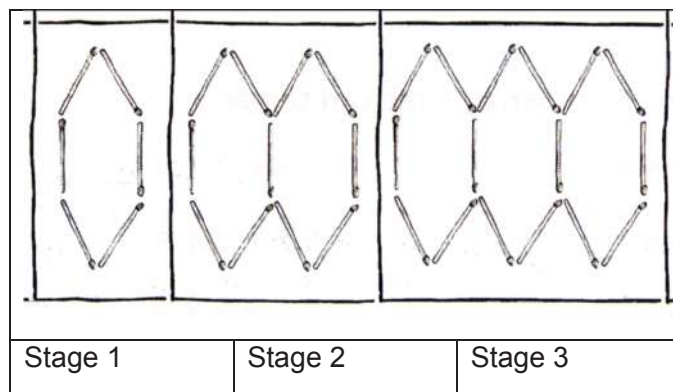
				15
				
				
		11	14	

- 8 John is working 7 hours a day on Saturdays. How many minutes does he work in one month? (2)

- 9 Fill in the missing input and output values in the flow diagram below. (2)



- 10 The hexagons made of matchsticks below form a pattern.



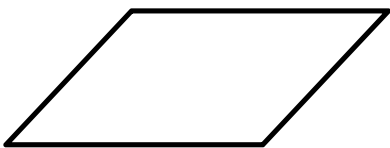
- 10.1 Complete the table below to illustrate the number of match sticks and hexagons in each stage. (3)

No. of hexagons	1	2	3	4		10		—
Number of matchsticks	6	11	16	—		—		76

- 10.2 Describe the general rule for the above pattern in your own words. (2)

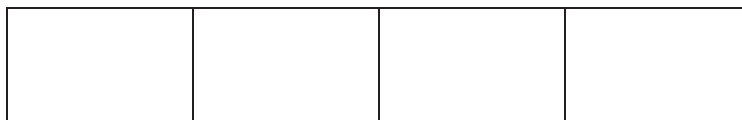
- 10.3 Write down any number sentence to describe the pattern above. (1)

- 11 Write down the similarity and the difference between a rectangle and a parallelogram. (2)

Parallelogram	Rectangle
	

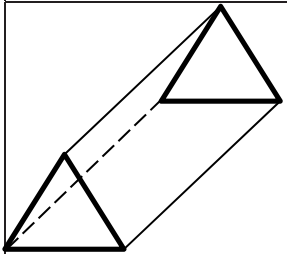
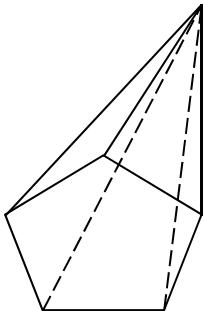
Similarity	Difference

- 12 How many different rectangles are there in the shape below? (2)



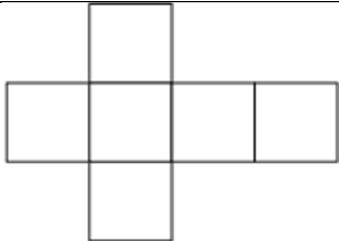
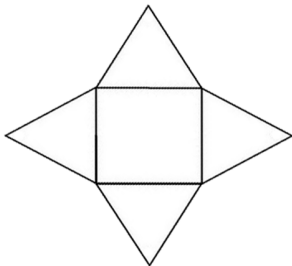
13 Complete the table below.

(4)

3-D OBJECT	Name	Number of faces	Number of edges	Number of vertices
	_____	5	9	_____
	Pentagonal pyramid	_____	_____	6

14 Name the 3-D objects that can be formed from the nets below.

(2)

	
14.1 _____	14.2 _____

- 15 The clocks below show time for different countries in the morning of 13 April.

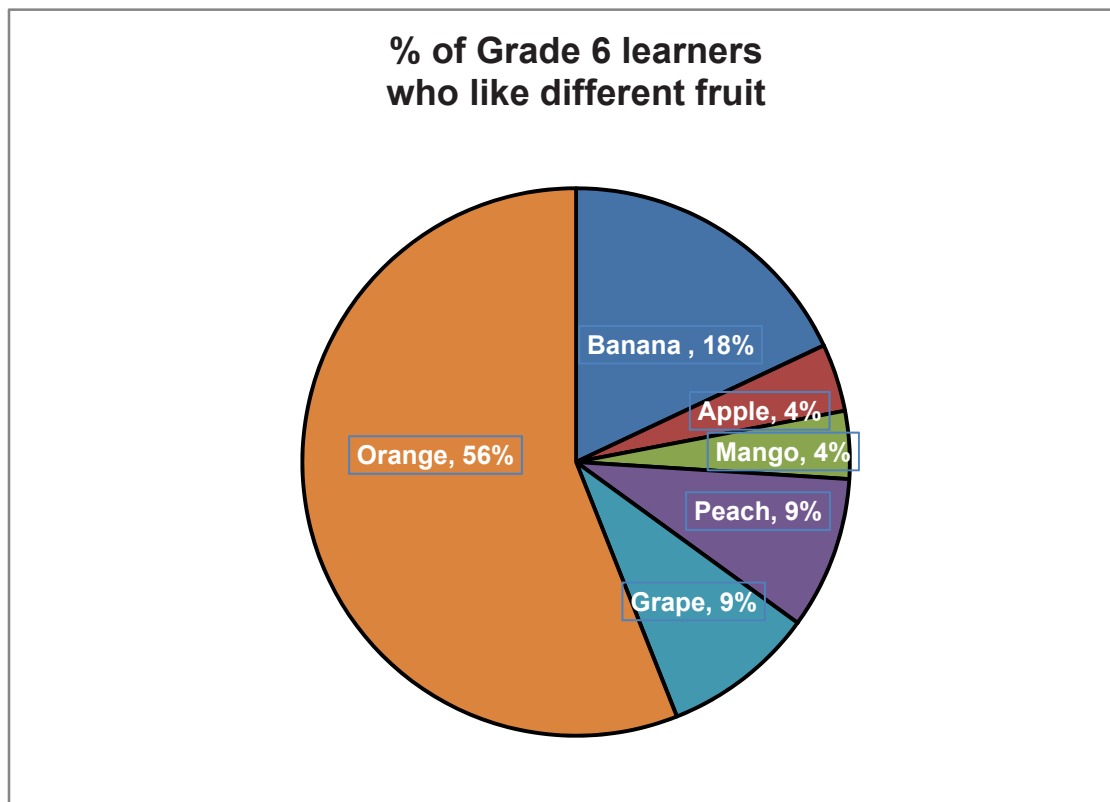
COUNTRY A : 13 APRIL	COUNTRY B : 13 APRIL
	

If the time in country B is 3:00 a.m., what will the time and date in country A be in 24 hour format? (2)

- 16 To make a 250 ml of juice, one needs 50 ml orange juice and 200 ml water. What is the ratio of orange juice to water in its simplest form? (2)

- 17 How many 250 ml juice can be made from 2 l orange juice? (2)

- 18 The pie chart below shows the percentages of Grade 6 learners who like different types of fruit. There are 45 Grade 6 learners in the school.



- 18.1 Which are the two types of fruit that learners like the least? (2)

- 18.2 What type of fruit is most liked by learners? (1)

- 18.3 What is the percentage of learners who like peaches more than mango? (2)

18.4 Determine as a decimal fraction the number of learners who likes grapes. (1)

19 The following data indicates the number of eggs laid by chickens at Mr Bee's farm.

66	72	69	64	68
66	72	69	66	68
64	69	72	66	66
65	71	66	72	

19.1 What is the mode of the data? (1)

19.2 What is the median of the data? (1)

Total: 75 marks

GRADE 6 EXAMINATION EXEMPLAR: MEMORANDUM

Important information

- This is a marking guideline. In instances where learners have used different mathematically sound strategies to solve the problems, they should be credited.
- Underline errors committed by learners and apply Consistent Accuracy (CA) marking.

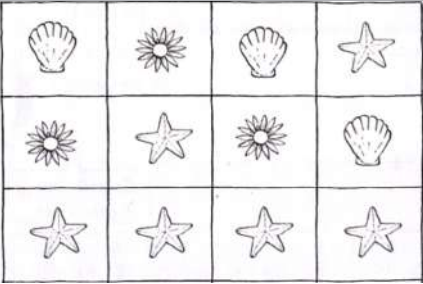
KEY	
M	Method mark.
CA	Consistent Accuracy mark.
A	Accuracy mark.
S	Statement.
R	Reason.
S/R	Statement and reason.

1.1.	B ✓	Hundred thousands	1.6	B ✓	4
1.2	D ✓	11	1.7	A ✓	163
1.3	B ✓	0,2	1.8	C ✓	6 200
1.4	C ✓	 With 2 lines of symmetry	1.9	D ✓	25%
1.5	D ✓	8; 16	1.10	C ✓	8
1 mark for each correct answer					

Ques.	Answer	Mark allocation	Total
2.1	5,5 ✓ A	Answer: 1 mark	1
2.2	189 243; 198 123; 891 123; 918 143 ✓ A	Answer: 1 mark	1
3.1	= ✓ A	Answer: 1 mark	1

3.2	<✓ A	Answer: 1 mark	1
4.1	$(3 + 7) \div 2 + 3 \times 5 - 3 \div 3$ $10 \div 2 + 15 - 1$ ✓ M $5 + 14$ 19 ✓ A	$10 \div 2 + 15 - 1$: 1 mark Answer: 1 mark	2
4.2	$25\ 583$ $8\ 654$ ✓ M $+ \ 2\ 910$ $\underline{\hspace{1cm}}$ $37\ 147$ ✓ CA	Any correct method: 1 mark Answer: 1 mark	2
4.3	$93\ 056$ $- \underline{63\ 625}$ ✓ M $\underline{\hspace{1cm}}$ $29\ 431$ ✓ CA	Any correct method: 1 mark Answer: 1 mark	2
4.4	$2\ 058$ ✓ M $\times \ 268$ $16\ 464$ $123\ 480$ $\underline{411\ 600}$ ✓ A $551\ 544$ ✓ A	Method: 1 mark All 3 products: 1 mark Answer: 1 mark	3
4.5	$3,54 + 2,83$ $3,54$ $+ \underline{2,83}$ ✓ M $6,37$ ✓ A	Any correct method: 1 mark Answer: 1 mark	2

4.6	1 2 5 10 ✓ M $\begin{array}{r} 475 \overline{)8\,648} \\ \underline{-4\,750} \quad (475 \times 10 = 4\,750) \\ 3\,898 \\ \underline{-2\,375} \quad (475 \times 5 = 2\,375) \quad \checkmark \text{ M} \\ 1\,523 \\ \underline{-950} \quad (475 \times 2 = 950) \\ \hline 573 \\ \underline{-475} \quad (475 \times 1 = 475) \\ 98 \\ 8\,648 \div 475 = 18 \text{ rem } 98 \quad \checkmark \text{ A} \end{array}$	Any correct method: 2 marks Answer: 1 mark	3
4.7	$3\frac{3}{10} - 2\frac{2}{5}$ $3 - 2 + \frac{3}{10} - \frac{4}{10} \quad \checkmark \text{ M}$ $\frac{10}{10} + \frac{3}{10} - \frac{4}{10}$ $\frac{13}{10} - \frac{4}{10} \quad \checkmark \text{ A} = \frac{9}{10} \quad \checkmark \text{ CA}$	$3 - 2 + \frac{3}{10} - \frac{4}{10} : 1 \text{ mark}$ $\frac{13}{10} - \frac{4}{10} : 1 \text{ mark}$ Answer: 1 mark	3
5.	100% - 75% = 25% ✓ M $\frac{25}{100} \times 400 \quad \checkmark \text{ M}$ R100 ✓ A OR	25%: 1 mark $\frac{25}{100} \times 400 : 1 \text{ mark}$ Answer: 1 mark Or $\frac{75}{100} \times 400 : 1 \text{ mark}$	3

	$\frac{75}{100} \times 400 \checkmark \text{ M}$ R300 $\checkmark \text{ A}$ R400 – R300 = R100 $\checkmark \text{ A}$	R300: 1 mark Answer: 1 mark	
6	R 1 200 $\div 10 = \text{R } 120 \checkmark \text{ A}$ $\checkmark \text{ A}$ R 120 $\times 15 = \text{R } 1\,800 \checkmark \text{ A}$ OR 5 textbooks = R1 200 $\div 2 = \text{R } 600 \checkmark \text{ A}$ $\checkmark \text{ A}$ = R1 200 + R600 = R1 800 $\checkmark \text{ A}$	R120: 1 mark R 120 $\times 15$: 1 mark Answer: 1 mark Or R600: 1 mark R1 200 + R600: 1 mark Answer: 1 mark	3
7.	 11 $\checkmark$ 12 $\checkmark$ 11 14 15 13 $\checkmark$ 20 $\checkmark$		4
8	$\checkmark \text{ M}$ $7 \times 4 \times 60 = 1680 \text{ minutes} \checkmark \text{ A}$	Any correct method: 1 mark Answer: 1 mark	2

9.	6 8 5✓ 10 × 7 + 3 45 59✓ 38 73	2																		
10.1	<table><tr><td>No. of hexagons</td><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td>10</td><td></td><td>15 ✓</td></tr><tr><td>No. of match sticks</td><td>6</td><td>11</td><td>16</td><td>✓ 21</td><td></td><td>51 ✓</td><td></td><td>76</td></tr></table>	No. of hexagons	1	2	3	4		10		15 ✓	No. of match sticks	6	11	16	✓ 21		51 ✓		76	3
No. of hexagons	1	2	3	4		10		15 ✓												
No. of match sticks	6	11	16	✓ 21		51 ✓		76												
10.2	Multiply the stage number by 5 ✓ A and add 1 ✓ A	Stage number × 5: 1 mark +1: 1 mark	2																	
10.3	5 × 1 + 1 = 6 5 × 2 + 1 = 11 ✓ A 5 × 3 + 1 = 16	Any correct number sentence: 1 mark	1																	
11.	<table><tr><td>Similarity ✓</td><td>Difference ✓</td></tr><tr><td>Two opposite sides are equal / parallel.</td><td>Parallelogram has 2 obtuse and 2 acute angles and in a rectangle all are right angles</td></tr></table>	Similarity ✓	Difference ✓	Two opposite sides are equal / parallel.	Parallelogram has 2 obtuse and 2 acute angles and in a rectangle all are right angles	2														
Similarity ✓	Difference ✓																			
Two opposite sides are equal / parallel.	Parallelogram has 2 obtuse and 2 acute angles and in a rectangle all are right angles																			
12.	10 different rectangles ✓✓	More than 4 different rectangles: 1 mark Answer: 1 mark	2																	

13.					4
	Name	No. of faces	No. of edges	No. of vertices	
	Triangular prism✓A			6✓ A	
		6✓ A	10✓ A		
14.1	Cube ✓ A		Answer: 1 mark		1
14.2	Square pyramid ✓ A		Answer: 1 mark		1
15.	Monday at 20:00. ✓ A 12 April✓ A		20:00: 1 mark 12 April: 1 mark		2
16	50: 200 ✓ A 1:4 ✓ CA		50: 200: 1 mark Answer: 1 mark		2
17	2 000 ml ÷ 50 ml ✓ M 40 ✓ CA		2 000 ml ÷ 50 ml: 1 mark Answer: 1 mark		2
18.1	Apple ✓ A and mango ✓ A		Correct answer each: 1 mark		2
18.2	Orange ✓ A		Answer: 1 mark		1
18.3	9 % – 4 % ✓ A 5 % ✓ A		9 % – 4 %: 1 mark Answer: 1 mark		2
18.4	$\frac{9}{100}$ = 0,09✓ A		Answer: 1 mark		1
19.1	66 ✓ A		Answer: 1 mark		1
19.2	68 ✓ A		Answer: 1 mark		1

Total: 75 marks

7. INVESTIGATIONS

(a) Purpose of a mathematics investigation

Investigations promote critical and creative thinking. They are primarily used to discover rules or concepts and may involve inductive reasoning, identifying or testing patterns or relationships, drawing conclusions, and establishing general trends.

(b) Developing a mathematics investigation

Since investigations are primarily used to discover rules or concepts, relevant mathematics content should be selected to enhance inductive reasoning. On the other hand, an investigation involves a guided discovery, where learners are led through a process of discovering a particular concept or idea through leading questions. This guided discovery may include the collection of data and/or information to solve a problem. In the CAPS the cue for the relevant concepts that are appropriate for the investigation are prefixed by “investigate...”. For instance, in the Measurement topic *The Theorem of Pythagoras* learners are required to “Investigate the relationship between the lengths of the sides of a right-angled triangle to develop the Theorem of Pythagoras”.

Similarly, in Space & Shape in the topic construction of geometric figures, learners are required to “By construction, investigate the angles in a triangle, focusing on:

- *the sum of the interior angles of triangles*
- *the size of angles in an equilateral triangle*
- *the sides and base angles of an isosceles triangle*

The acquisition of the investigative skill in mathematics does not happen spontaneously; instead it happens as a result of the investigative teaching approach. In other words, teachers must employ the investigative teaching approach to guide their learners to discover general rules in mathematics or establishing general trends. Learning through investigation is one of the meaningful ways to enhance conceptual understanding.

(c) Administering a project

To avoid having to assess work which is copied without understanding, it is recommended that whilst initial investigation could be done at home, the final write-up should be done in class, under supervision, without access to any notes.

Investigations are generally assessed using rubrics, which can be specific to the task, or generic, listing the number of marks awarded for each skill. These skills include:

- organising and recording ideas and discoveries using, for example, diagrams and tables
- communicating ideas with appropriate explanations
- calculations showing clear understanding of mathematical concepts and procedures
- generalising and drawing conclusions

7.1. Grade 4 Investigation exemplar

INVESTIGATING THE COMBINATIONS OF REGULAR POLYGONS

The aim of this assessment task is to assist you to discover properties and characteristics of shapes that can make meaningful combinations such as tiling and tessellations, including transformations.

NB: Use the rubric on the last page as a checklist in order to ensure that you have completed each activity as required. This checklist will also assist you to obtain a good score for this assessment task if you follow all instructions and answer all questions carefully.

Name: _____

Grade: _____

What are composite shapes? (As in tessellations)

Basically, a combination of regular polygons could be a number of similar shapes placed side by side in order to form a certain pattern (design). This is another way to show how the tiling of floors with shapes can be done, so that there is no overlapping and no gaps in between shapes.

COMPOSITE SHAPES:

RULE 1: The combinations of regular polygons must be designed in such a way that it could tile a floor, as a pattern, without overlapping one another or leaving gaps in between the shapes.

RULE 2: The tiles could be regular polygons – having equal sides.

Activity 1: Which regular polygons form a pattern/combination?

1.1 Trace and cut out the regular polygons in the addendum.

1.2 Tile an A4 cardboard with each of them.

1.3 Determine whether a combination that form a pattern is possible with the shape. **NB:** Start with a triangle until you try with an octagon.

Record your findings:

Name of polygon	How many sides does it have?	Form a pattern – Yes/No
Triangle		
Square		
Rectangle		
Name of polygon	How many sides does it have?	Tessellate – Yes/No
Pentagon		
Hexagon		
Octagon		

1.4 What did you discover from the previous activity regarding the:

- a) triangle, square and the rectangle?

- b) pentagon, hexagon and the octagon?

Activity 2: Create your own composition of shapes (tessellation)

You may use the same shapes as was given, however you are to design a pattern in terms of the rules in Activity 1 in an A4 or bigger page image. The design MUST be coloured to look like something, e.g. house, person, etc.

Activity 3:

- a) List three places in your surroundings in which such patterns/tessellations appear.
- b) List three places in nature in which such patterns/tessellations appear.

GRADE 4 INVESTIGATION EXEMPLAR: MARKING GUIDE

RUBRIC

Activity 1

Your final product must include:	Checklist	Max	Mark
Trace and cut out the regular polygons		5	
Determination of whether a combination forms a pattern		5	
A summary of the findings/discovery made		3	
Total		13	

Activity 2

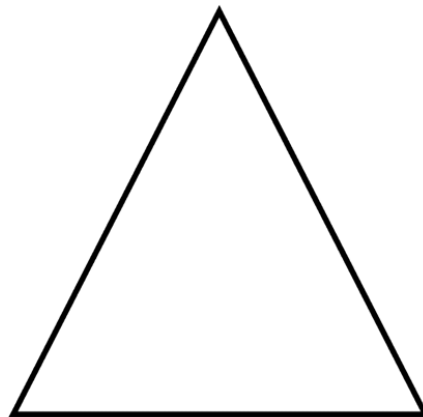
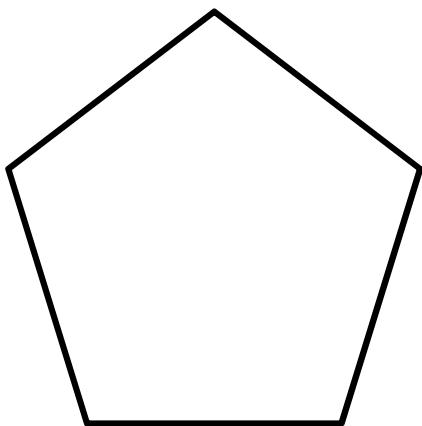
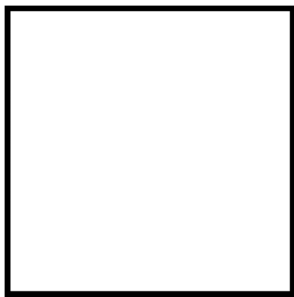
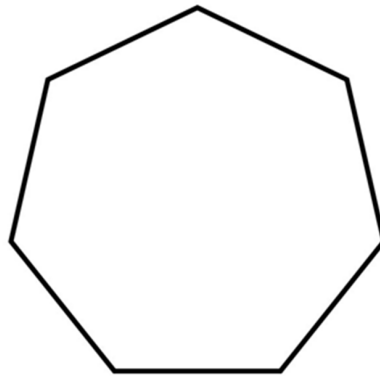
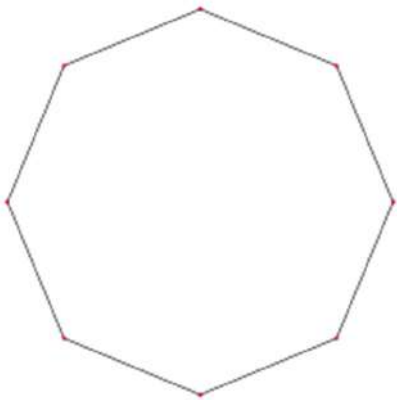
Your final product must include:	Checklist	Max	Mark
The tile(s) that you combined (tessellated)		2	
Correctly combining/tessellating the image		3	
The image in the pattern is repeated enough times to fill the entire page (A4 is fine, but you may create a larger poster if you wish). The image must form a pattern by at least 20 times/shapes		3	
The tessellated images MUST be coloured to look like something. Simply colouring the shapes will not earn you full credit.		4	
Total		12	

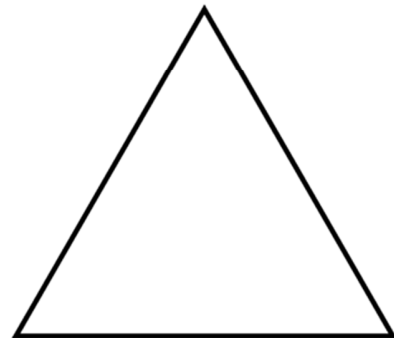
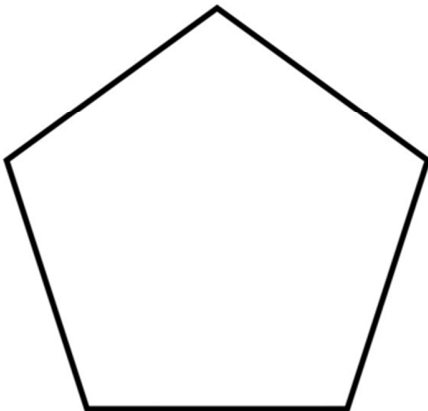
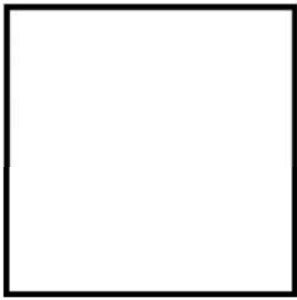
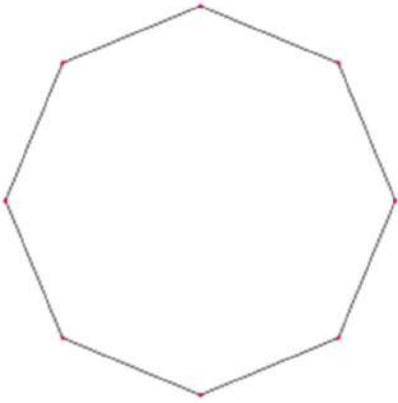
Activity 3

Context of patterns/tessellations	Checklist	Max	Mark
Places in your surroundings and in nature where such patterns/tessellations exist		5	

Total: 30

Polygons





7.2. Grade 5 investigation exemplar

INVESTIGATING PROBABILITY

In this investigation, you will complete three activities in groups in order to discover the probability of certain events. The aim of the investigation is to assist you to discover the idea of probability through experiments.

NB: Work in groups of three and each person does the experiments. Combine your results at the end of each experiment.

Use the rubric on the last page as a checklist in order to ensure that you have completed each experiment and answered the questions as required. This checklist will also assist you to obtain a good score for this assessment task if you follow all instructions.

Name: _____

Grade: _____

Experiment 1:

- 1) Draw a picture of your spinner.

- 2) Spin your spinner twelve times and record the results in the table below.

Colour	Red	Blue	Green	White
SPIN 1				
SPIN 2				
SPIN 3				
SPIN 4				
SPIN 5				
SPIN 6				
SPIN 7				
SPIN 8				
SPIN 9				
SPIN 10				
SPIN 11				
SPIN 12				
TOTAL				

- 3) Compare your results with those of your friends. What do you observe?

- 4) After 12 spins, how many times did the spinner land on red?

- 5) After 12 spins, how many times did the spinner land on blue?

- 6) After 12 spins, how many times did the spinner land on white?

- 7) Can you predict where the spinner will land? Explain.

Experiment 2:

- 1) Flip a coin 10 times for the first trial and record the number of heads or tails you got in the table below:

	Number of flips	Number of heads	Number of tails
First trial	10		
Second trial	10		
TOTAL	20		

- 2) Write a fraction of the number of heads out of 10 tosses and the number of tails out of 10 tosses. _____

- 3) Did the results surprise you? Why?

- 4) Write the results as the second trial and complete the table above.

- 5) Calculate the totals. Did you expect this result? Why?

- 6) Combine the results of all three groups (three pairs) – 60 in total. Write fractions out of the total for heads out of 60 and tails out of 60. What do you notice?

- 7) What do you think would happen if you flipped the coin 100 times? 1 000 times? Why?

Experiment 3:

Place **three red, two blue, two green, and five yellow cards** in an open bag/box or hat.

You will draw one card at a time for this experiment and replace the card after each draw.

- 1) There are 12 cards in the bag. Do you have a better chance of drawing red or of drawing blue? Why? What colour are you most likely to draw? Why?

- 2) Make 12 draws, remembering to return the card to the bag/box after each draw. Record the results in the first row for the first trial.

	Number of draws	Number of red drawn	Number of blue drawn	Number of yellow drawn	Number of green drawn
First trial	12				
Second trial	12				
TOTAL	24				

- 3) Share your results with your friend. Write their results as the second trial. Calculate the totals. Did you expect this result? Why?

- 4) Combine the results of all three in the group – 72 draws in total. Write fractions out of the total for each coloured card drawn.

- 5) Compare the total results with your predictions. Are they alike or different? Why?

Conclusion:

- What common fraction, in the previous table no. 4, is this closest to?

- Place these words on a probability line: **unlikely**, **likely**, **possible**, **impossible**, and **even chance**

0 _____ 1

- Does probability tell us exactly what happens? Explain.

GRADE 5 INVESTIGATION EXEMPLAR: MARKING GUIDE

Rubric:

Criteria	4	3	2	1	0
1. A picture of the spinner and records	A picture of the spinner has been drawn and records have been kept, neatly and precisely	A picture of the spinner has been drawn and records have been kept.	A picture of the spinner has been drawn and part of the records have been kept.	An incorrect picture of the spinner has been drawn and part of the records have been kept.	No picture and no records.
2. Stated the probability of the spinner landing on red, blue and white	The probability of the spinner landing on red, blue and white, has been clearly and well stated.	The probability of the spinner landing on red, blue and white, has been stated.	Some of the probability of the spinner landing on red, blue and white, has been stated.	The probability of the spinner landing on red, blue and white, has not been stated.	No statement made
3. Recorded the number of heads or tails	The number of heads or tails has been recorded with more clarity.	The number of heads or tails has been recorded.	Not all the number of heads or tails has been recorded.	Incorrect recording made	No recording made
4. Recorded the results of 12 draws made	The results of 12 draws made have been recorded with better clarity	The results of 12 draws made have been recorded	Not all the results of 12 draws recorded were made	Incorrect results of 12 draws were made/ recorded	No results were made
5. Conclusions	Findings and conclusions were well written	Findings and conclusions were written	Some of the findings and conclusions were poorly communicated	Incorrect findings and conclusions were poorly communicated	No findings and conclusions communicated

TOTAL: 20

7.3. Grade 6 investigation exemplar

Surname:

Name:

Duration: 60 minutes

What is an Investigation? Caps, page 229

An investigation promotes critical and creative thinking. It can be used to discover rules or concepts and may involve inductive reasoning, identifying or testing patterns or relationships, making conclusions, and establishing general trends. To avoid having to assess work that is copied without understanding, it is recommended that whilst initial investigation could be done at home, the final write-up should be done in class, under supervision, without access to any notes. Investigations are assessed with rubrics, which can be specific to the task, or generic, listing the number of marks awarded for each skill, for example:

- Organising and recording ideas and discoveries using, for example, diagrams and tables
- Communicating ideas with appropriate explanations
- Calculations showing clear understanding of mathematical concepts and procedures
- Generalising and making conclusions

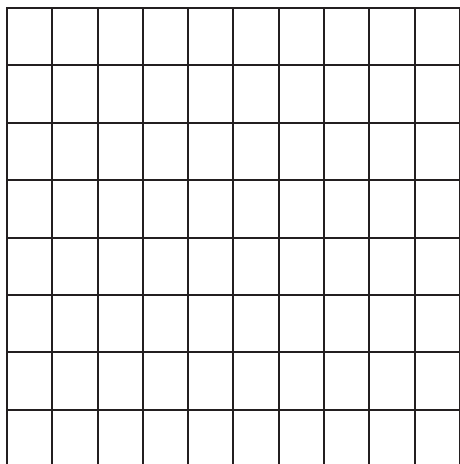
NB: The teacher must ensure that learners are given grid paper to draw their shapes.

NB: Learners use the rubric on the last page as a checklist in order to ensure that you have completed each activity as required. This checklist will also assist you to obtain a good score for this assessment task if you follow all instructions and answer all questions carefully.

TOPIC: Investigate the relationship between the area and perimeter of squares and rectangles. (CAPS pg. 282-283)

AIM: In this investigation you will discover the relationship between the area and perimeter of squares and rectangles.

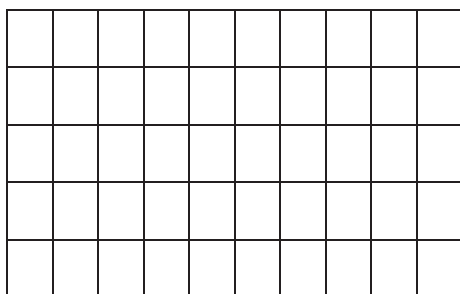
1 a. Draw at least two different rectangles on 1 cm squared paper, all with the same perimeter of 16 cm.



b. Does the area remain the same? _____

c. Would you be able to draw different squares, all with the same perimeter? _____

d. Draw a square with an area of 4 square centimetres. Record the perimeter.

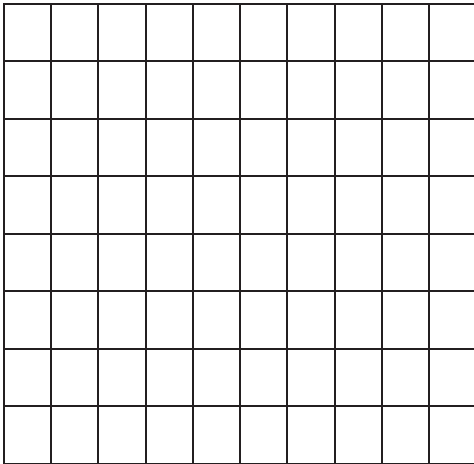


Perimeter = _____

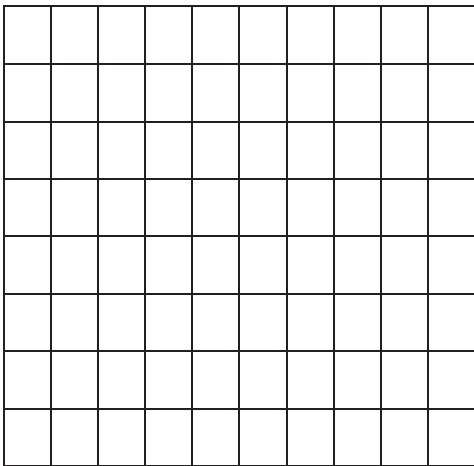
2. Use a piece of 1 cm squared paper to draw these shapes:

a. A square A with sides 4 cm.

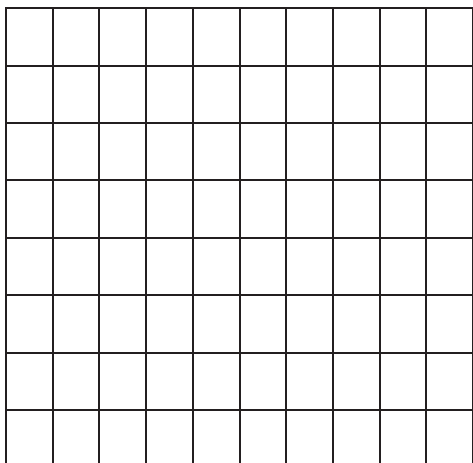
b. A rectangle B with a length of 8 cm and a width of 2 cm.



c. Enlarge the square by doubling the measurement of each side.

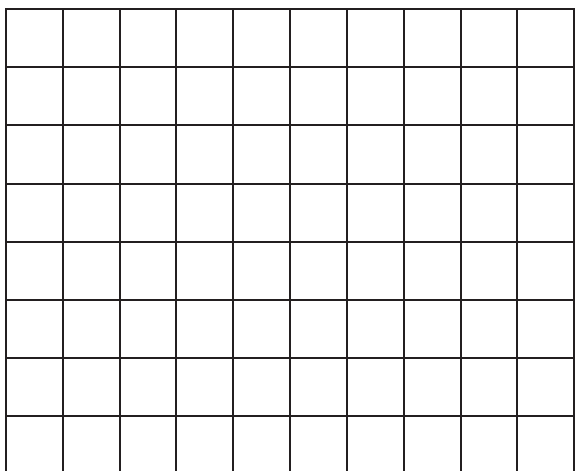


d. Enlarge the rectangle by doubling the measurement of each side.

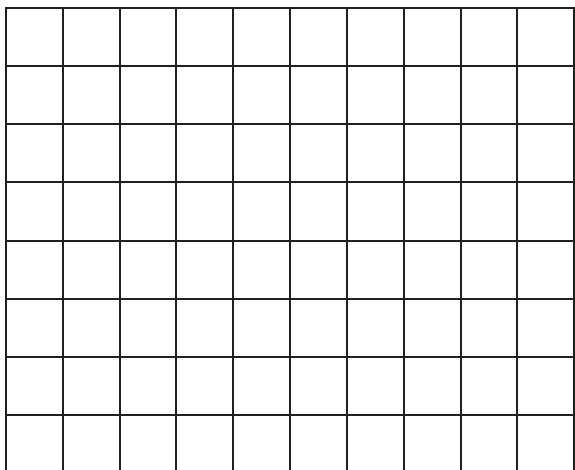


e. What happens to the perimeter and the area of the shapes after they have been doubled?

f. Reduce a square by halving the measurement of each side.



g. Reduce a rectangle by halving the measurement of each side.



h. What happens to the perimeter and the area of the shapes after they have been reduced?

GRADE 6 INVESTIGATION EXEMPLAR: MARKING GUIDE

Rubric:

Criteria	4	3	2	1	0
1. Drawing rectangle with perimeter of 16 cm	Rectangle drawn with 16 cm perimeter, clearly labelled units and sides	Rectangle drawn with 16 cm perimeter	Rectangle drawn with incorrect perimeter	The diagram drawn is not a rectangle	No diagram drawn
2. Drawing of square with an area of 4 cm².	A square drawn with an area of 4 cm ² , clearly labelled units and sides	A square drawn with an area of 4 cm ²	A square drawn with incorrect perimeter	The diagram drawn is not a square	No diagram drawn
3. Drawing of a square and a rectangle.	Square and rectangle drawn with correct dimensions, clearly labelled units and sides	Square and rectangle drawn with correct dimensions	Square and rectangle drawn with incorrect dimensions	The diagrams drawn are not a rectangle and a square	No diagram drawn
4. Communicating the findings for doubling the area and perimeter.	A clear description of what happens to the perimeter and the area of the shapes after they have been doubled	A reasonable description of what happens to the perimeter and the area of the shapes after they have been doubled	Any logical explanation for the doubling of area and perimeter	An explanation is incorrect	No explanation provided

5. Communicating the findings for reducing the area and perimeter.	A clear description of what happens to the perimeter and the area of the shapes after they have been reduced	A reasonable description of what happens to the perimeter and the area of the shapes after they have been reduced	Any logical explanation for reducing the area and perimeter	An explanation is incorrect	No explanation provided
---	--	---	---	-----------------------------	-------------------------

TOTAL = 20 MARKS

8. PROJECT

(a) Purpose of a mathematics project

Projects are used to assess a range of skills and competencies. Through projects, learners are able to demonstrate their understanding of different Mathematics concepts and apply them in real-life situations. It is therefore essential that conceptual understanding should be emphasised in the teaching and learning of mathematics so that the concepts are applied meaningfully. Good projects involve the collection and display of real data, followed by deductions that can be substantiated. The assessment criteria should be clearly indicated on the project specification and should focus on the Mathematics involved and not on duplicated pictures and facts copied from reference material.

(b) Developing mathematics projects

Since projects are used to assess a range of skills and competencies, it is advisable to develop a project after a substantial amount of mathematics concepts are covered. It is for this reason that a project is administered in Terms 3 and 4 in Mathematics.

The following are some of the issues to be considered when developing a project:

- A theme or a focus of the project should be carefully conceptualised such that it is appropriate, relevant and appealing to the learners. In other words the theme/focus should speak to the learners' context.
- Although the project theme/focus may be used to create awareness of how mathematical relationships are applied in social, environmental, cultural and economic contexts, the choice of these contexts should be sensitive to issues of gender, disability, race, etc., and should generally contribute to social cohesion.
- The data to be collected should be accessible to the learners. For instance, if the data to complete a project are exclusively obtainable from the Internet, learners who do not have access to the Internet will not be able to complete and present their project.
- If the project requires learners to collect data outside the school environment, the general welfare of learners should be considered.

(c) Administering a project

One mathematics project should be administered per grade per year. Although this is the case, teaching should be characterised by, *inter alia*, project-based learning to expose learners to and prepare them adequately on the subtleties of presenting good projects. In other words, learners should not be exposed to a project for the first time when they are assessed formally.

When administering mathematics projects, teachers are urged to explain the requirements and the process of carrying out the project. Projects are generally context-based and if not thoroughly explained, learners are likely to be distracted by the context and lose the essence of mathematics embedded in the project.

Unlike other forms of assessment such as tests/examinations, mathematics projects take longer to complete; therefore clear guidelines should be provided to learners on the timelines for submitting different sections of the project. In other words it is recommended that a Mathematics project should be presented and marked/evaluated in stages to: *firstly* ease the workload associated with marking long projects if they are not presented in stages; and *secondly* to identify learner mistakes earlier so that they can improve the next stages of the project, subsequently optimising the chances of overall performance in the project.

8.1. Grade 4: Project exemplar

PATTERNS AND TESSELLATIONS

MARKS 40

TIME: 2 WEEKS

Projects are used to assess a range of skills and competencies. Through projects, learners are able to demonstrate their understanding of different Mathematics concepts and apply them in real-life situations. Caution should, however, be exercised not to give projects that are above learners' cognitive levels. The assessment criteria should be clearly indicated on the project specification and should focus on the Mathematics involved and not on duplicated pictures and facts copied from reference material. Good projects contain the collection and display of real data, followed by deductions that can be substantiated.

OVERVIEW

Patterns are repetitive sequences and can be found in nature, shapes, events, sets of numbers and almost everywhere you care to look. For example, seeds in a sunflower, snowflakes, geometric designs on quilts or tiles. Patterns are found everywhere in nature, from the leaves on a tree to the microscopic structure of those leaves. Shells and rocks have patterns, animals and flowers have patterns, even the human body follows a pattern and includes countless patterns within it.

By studying patterns in mathematics, humans become aware of patterns in our world. Observing patterns allows individuals to develop their ability to predict future behavior of natural organisms and phenomena. Civil engineers can use their observations of traffic patterns to construct safer cities. Meteorologists use patterns to predict thunderstorms, tornadoes, and hurricanes. Seismologists use patterns to forecast earthquakes and landslides. Mathematical patterns are useful in all areas of our life.

In nature, patterns are not set to a standard of rules. Sure, we can identify patterns, but they are not necessarily uniform. One snowflake has a pattern that is different from every other snowflake, for instance. A natural pattern can also be broken up by a single irregularity or be found outside of the context of an exact replication. For instance, a species of tree may have a pattern to its branches but that doesn't mean every branch grows from a designated spot. Man-made patterns, on the other hand, tend to strive for perfection.

This project will ensure that learners develop the following specific aims:

- an appreciation for patterns and that

- a critical awareness of how mathematical relationships are used in social, environmental, cultural and economic relations
- a spirit of curiosity and a love for Mathematics
- an appreciation for the beauty and elegance of Mathematics
- recognition that Mathematics is a creative part of human activity
- deep conceptual understanding in order to make sense of Mathematics
- acquisition of specific knowledge and skills necessary for the application of Mathematics to physical, social and mathematical problems
- the study of related subject matter (e.g. other subjects).

IMPLEMENTING THE PROJECT

1. Working with number patterns:

1.1 Investigate and extend numeric patterns looking for relationships or rules of patterns.

1.2 Creating number patterns and codes.

2. Working with geometric patterns:

2.1 Investigate and extend geometric patterns looking for relationships or rules of patterns.

2.2 Creating geometrical patterns and codes.

3. Creating our own tessellations.

It is expected of every group to keep within the framework of progress of the project.

The project should be done over a period of two weeks.

Number Patterns:

Worksheet 1

Mathematicians are paid very well to create codes in high security environments. We often use codes to protect our interests. Here are some codes that are used in computers and security locks. See if you can break the following codes!

1.1 1 2 3 _ 2 1 (1)

1.2 1 2 2 1 2 _ 1 2 _ (2)

1.3 1 1 3 3 _ 1 3 3 (1)

1.4 A F K P _ _ Z (2)

1.5 E Z U P _ F _ A V Q (2)

Create your own 5-digit or 5-letter alphabetical code and see if your friends can break your code!

1.6

1.7

TOTAL:
/ 10

2. Name four places or occupations where we will find people that make use of codes to protect their interests, e.g. the army, etc.

2.1

2.2

2.3

2.4

TOTAL:
/ 4

Worksheet 2

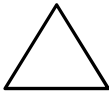
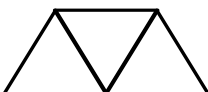
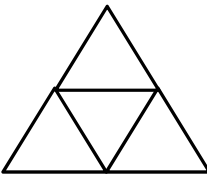
Codes can also be made by using colours, such as the example below.
Create your own colour code, using only three different colours in no. 1.1
Complete the following codes by inserting the missing symbol. (1.2 – 1.4)
Use four different 2D shapes to create your own secret codes. (1.5 – 1.8)

	Red	Orange	Blue	Red	Orange	Blue			
1.1									(1)
1.2							—	—	(1)
1.3				—					(1)
1.4						—		—	(1)

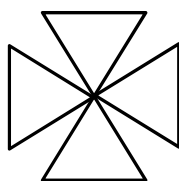
1.5								(1)
1.6								(1)
1.7								(1)
1.8								(1)

You are now able to see that we can use any shape or number or symbol to form a pattern and that there are an infinite number of patterns or combinations of patterns.

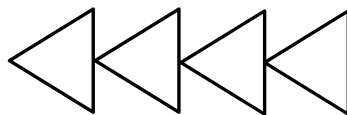
1. Triangles can become patterns:

STEP 1	STEP 2	STEP 3	STEP 4	How many triangles in STEP 100?
				_____
1 Triangle	2 Triangles	3 Triangles	4 Triangles	(1)

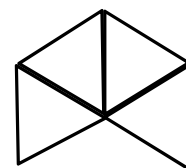
You will find that there are many different ways to arrange four triangles (of the same size), such as the following three examples provided. Try your own combinations.



No. 1



No. 2



No. 3

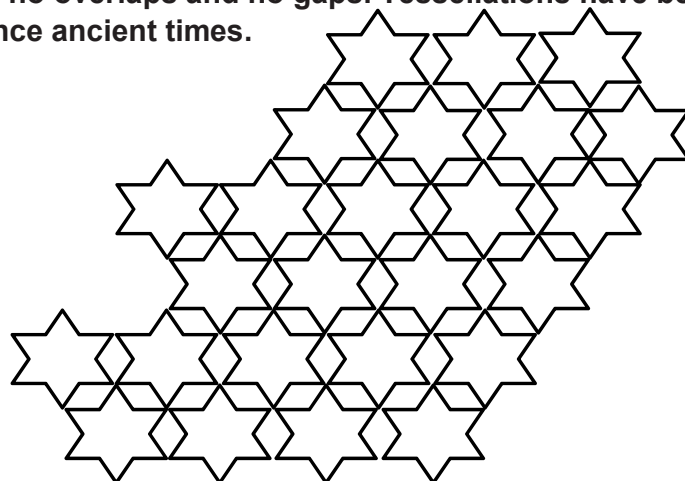
Numbers 1 and 2 are just arrangements of triangles, but number 3 is a special arrangement where the tiles have no overlapping or any gaps between them.

_____ (2)

When we arrange any shapes so that no gaps are left, we say that the shapes are tessellating. A tessellation of a flat surface is the tiling of a [plane](#) using one or more [geometric shapes](#), called tiles, with no overlaps and no gaps. Tessellations have been used to create decorative motifs since ancient times.

Let's create!

Examples of beautiful plates:



Worksheet 3:

Activity 1: Create your own tessellation with the attached polygons

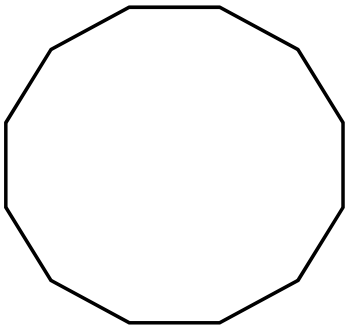
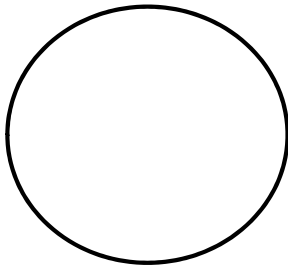
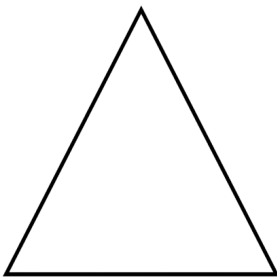
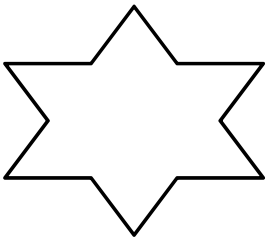
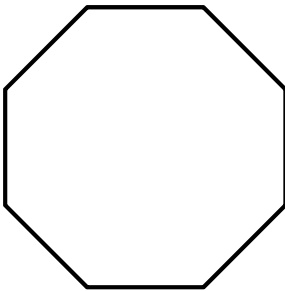
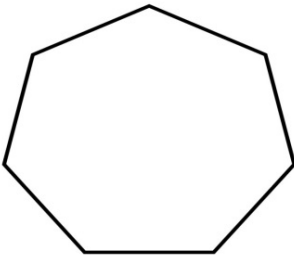
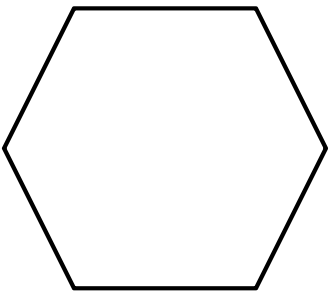
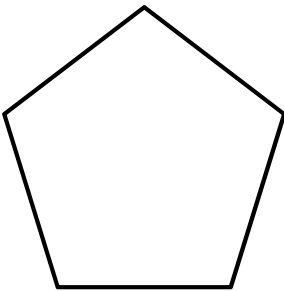
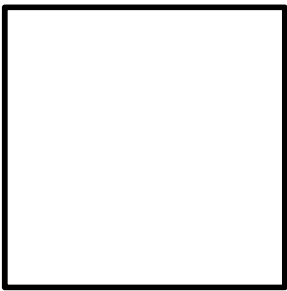
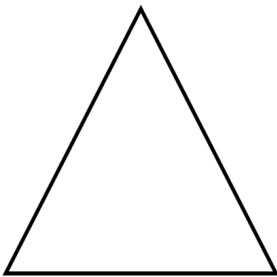
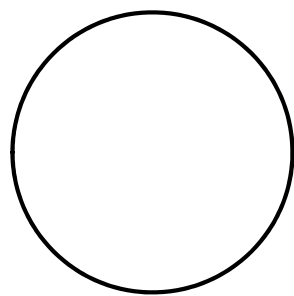
Trace and cut out the regular polygons in the addendum and tile a cardboard (or a page), with any of them. Determine whether a tessellation is possible with that shape. Start with the circle and end with the octagon.

Activity 2: Create your own tessellations

Your final product must include:	Checklist	Max	Mark
• The tile that you tessellated		1	
• Correctly tessellating the image		2	
• The image tessellated enough times to fill the entire page (A4 is fine, but you may create a larger poster if you wish)		2	
• The tessellated images MUST be coloured.		2	
• Your tessellation MUST find a place where all people can appreciate it. (Wall, book, window, etc. ANY place where it can serve as a decoration.)		8	
Total		15	

Total: 40

Addendum: Shapes



8.2. Grade 6: Project exemplar

Subject: Mathematics

Form of assessment task: Project

Grade: 6

Marks: 28

Name & Surname: _____

INSTRUCTIONS TO LEARNERS:

- Answer ALL the questions.
- Write your answer in the spaces provided.
- For Activity 2 and 3, record your data on the table and draw your graph on the grid provided.

Problem statement:

Your class is going to do a fundraising activity for the prize-giving day function. You want to sell different kind of soft drinks to your fellow learners. To do this you need to find out what soft drink your fellow learners like the most. You will have to write up your project results and give advice to the principal as to how much of each kind of drink should be ordered. Assume 150 people will buy drinks during the function.

Activity 1: Collecting data

You should:

- Interview 50 learners from different classes/grades.
- Select 5 to 10 learners per class/grade.
- Ask them what soft drink from the following list they like the most:
 - Coke
 - Cream soda
 - Spar-berry
 - Lemon twist
 - Iron brew
 - Fanta orange
 - Stoney

- Make a list of learners interviewed, class and grade, and their choice of soft drink (see example below). Submit the list with your project.

Example:

	Name of learner	Class/Grade	Drink
1			
2			
3			

Activity 2: Organising data

- Organise the data you collected on the table below:

Soft drinks	Tally	Frequency
Coke		
Cream soda		
Spar-berry		
Lemon twist		
Iron brew		
Fanta orange		
Stoney		
TOTAL		

Activity 3: Representing data

Represent the data you collected by drawing a graph on the grid provided below.
Choose the kind of graph that you think will best represent your data.
Give your graph a suitable title.

Title: _____



Activity 4: Analysing and interpreting

Use your table and your graph to answer the following questions:

4.1 Name the drink(s) that is the mode of the data.
_____ (1)

4.2 How is the mode identified in your graph?
_____ (1)

4.3 Which drink(s) need to be ordered in large quantities? Why?
_____ (2)

4.4 Which drink(s) should be ordered in small quantities? Why?

_____ (2)

4.5 Write a report to the school principal in which you summarise the data you collected from 50 learners. In the report determine how many of each type of drink must be purchased in order to serve 150 people. (4)

GRADE 6 MATHEMATICS ASSESSMENT RUBRIC AND MEMO

Name: _____

Grade: _____

Activity	Criteria	LEVELS					SCORE
		2	3	4	5	6	
1	Collecting data	Less than 25% of the required sample interviewed	About 25% of the required sample interviewed	50% of the required sample interviewed	More than 50% but less than 100% of the required sampled interviewed	A sample of 100% interviewed	
2	Organising data	Tallies and frequencies incorrect		Tallies correct but frequencies incorrect OR tallies incorrect but frequency correct		Tallies and frequencies correct	
3	Representing data	All the labels on the graph are incorrect	Less than half of the bars correct height. labels correct, bars not the same width and not equally spaced	Most bars correct height. Labels correct, bars not the same width and not equally spaced	Bars correct height. Labels correct, bars not the same width and not equally spaced	Bars correct height. Labels correct, bars the same width and equally spaced	
TOTAL	18						

Activity 4

- 4.1 Correct mode ✓
- 4.2 Tallest bar (bar graph), or correct answer according to graph used ✓
- 4.3 Correct response✓ reason ✓
- 4.4 Correct response✓ reason ✓
- 4.5 Two marks for summary report of data. ✓ ✓ Two marks for number of cans of each kind of drink to be ordered for 150 people (3 x number of cans for each type of drink) ✓ ✓

10 marks

[28 marks total]



222 Struben Street, Pretoria, 0001
Private Bag X895, Pretoria, 0001, South Africa
Tel: 012 357 3000 • Fax: 012 323 0601

Private Bag X9035, Cape Town, 8000, South Africa
Tel: 021 486 7000 • Fax: 021 461 8110
Call Centre: 0800 202 933

ISBN 978-1-4315-3142-4

Department of Basic Education



www.education.gov.za



www.twitter.com/dbe_sa



www.facebook.com/BasicEd