



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: FUNCTIONS AND RELATIONSHIPS: INPUT AND OUTPUT VALUES (Lesson 1)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to determine input values, output values or rules for patterns and relationships using

- tables
- formulae
- equations

3. RESOURCES:	Textbooks, Sasol-Inzalo Book 2.														
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none">• Functions and relationships														
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)															
<p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>															
6. INTRODUCTION (Suggested time: 10 Minutes)															
<p>Let learners complete the following activity:</p> <p>1 chicken has 4 legs. For 2 chickens, how many legs are there? For 3 chickens, how many legs are there? For 4 chickens, how many legs are there?</p> <p>Let learners complete the table below:</p> <table><tr><td>Number of chickens (x)</td><td>1</td><td>2</td><td>3</td><td>6</td><td>9</td><td>x</td></tr><tr><td>Number of legs (y)</td><td>4</td><td>8</td><td></td><td></td><td></td><td></td></tr></table> <p>a) Which are the input values? b) Which are the output values? c) Which are the two variables in the table above? d) Which one is the dependent variable? Explain why. e) Which one is the independent variable? Explain why. f) Write a verbal statement that relates the number of legs to the number of chickens in general. g) Write an algebraic statement that relates the number of legs to the number of chickens in general.</p> <p>Note:</p> <p>1. Number of legs is equal to 4 times the number of chickens. This can be written as: $y = 4x$, where y is the number of legs and x the number of chickens.</p> <p>2. The statement, $y = 4x$ can be true for any value of x, provided one chooses the appropriate value for y. The statement is true for certain combinations of values of x and y.</p>		Number of chickens (x)	1	2	3	6	9	x	Number of legs (y)	4	8				
Number of chickens (x)	1	2	3	6	9	x									
Number of legs (y)	4	8													



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to:)														
<p>Give learners the following activity which will focus them on the functional relationship between the input and output values:</p> <p>Activity</p> <p>Which of the following are equations for the function illustrated in the table?</p> <p>A. $y = 15x$ B. $y = -5x + 20$ C. $y = 5(4 - x)$ D. $y = 5x + 10$</p> <table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>y</td><td>15</td><td>10</td><td>5</td><td>0</td><td>-5</td><td>-10</td></tr></table> <p>Note: Allow learners to substitute the input (x) values into the equation to see whether they get the matching output (y) values.</p>	x	1	2	3	4	5	6	y	15	10	5	0	-5	-10	<ul style="list-style-type: none">work in pairs substituting into the given equations, and showing that the equation applies to all the cases in the table.report on how they have worked out their solutions.justify which equations work.
x	1	2	3	4	5	6									
y	15	10	5	0	-5	-10									

8. CLASSWORK (Suggested time: 15 minutes)

For each of the tables below determine which of the following formulae could have been used to complete the table. The symbol x is used to represent the input values and the symbol y is used to represent the output values.

- A. $y = x^2$
B. $y = 10x$
C. $y = x^2 + 2$
D. $y = 5x + 2$
E. $y = 3^x$

a)

x	1	4	11	30	40	60
y	7	22	57	152	202	302

b)

x	1	6	9	12	18	20
y	1	36	81	144	324	400



c)

x	1	6	9	12	18	20
y	3	38	83	1462	326	402

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

a) **Emphasise that:**

- a formula is a description of how the values of a dependent variable can be calculated for any given values of the other variable(s) on which it depends.
- the output depends on the input.
- learners consider the input and output values when searching for relationships.
- functional relationships can have more than one operator.

- b) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo Book 2, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework: Sasol-Inzalo Book 2 page 140 number 2. (d), (e) and (f).



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
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DATE:	
DURATION:	1 Hour

1. TOPIC: FUNCTIONS AND RELATIONSHIPS: INPUT AND OUTPUT VALUES (Lesson 2)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to determine input values, output values or rules for patterns and relationships using

- flow diagrams
- tables
- formulae
- equations

3. RESOURCES:

Textbooks, Sasol-Inzalo Book 2.



4. PRIOR KNOWLEDGE:

- Functions and relationships

5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)

Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.

6. INTRODUCTION (Suggested time: 10 Minutes)

Ask learners to complete the table looking for the relationships between the input values and the output values.

Input value	1	2	3	4	5	6	k
Output value	4		14	19			

Discuss how learners found their solutions. Some learners may have resorted to looking for relationships between the output values. At this level they must be encouraged to look for the relationship between the input and output value e.g. $4 = 5 \times 1 - 1$

$$= 5 \times 2 - 1$$

$$14 = 5 \times 3 - 1$$

$$19 = 5 \times 4 - 1$$

$$5 \times k - 1$$

From the pattern that emerges it becomes easy to find the formula.

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)**Teaching activities****Activity**

This activity is about the relationship between two variables. Some information about the relationship is given in the flow diagram below.



1. Use the instructions in the flow diagram to complete the table.

Input value	1	2	3	4	5	10	23	50	86
Output value									

Learning activities
(Learners are expected to:)

- work individually completing the table, writing the formula, giving a verbal description and solving equations.
- share solutions with the whole class.



2. Describe by means of a formula how to calculate the output value for any input value. Let x represent the input values and y the output values.

Answer: $y = 3x + 2$

3. Describe verbally how to calculate the output value for any input value.

Answer: Multiply the input value by 3 and then add 2 to the product.

4. What input value will make the statement $3x + 2 = 71$ true?

Answer: $x = 23$

5. What input value will make the statement $3x + 2 = 260$ true?

Answer: $x = 86$

8. CLASSWORK (Suggested time: 15 minutes)

Some information about the relationship between the output and the input values in a certain function is given in the flow diagram.



- d) Use the flow diagram below to complete the table

Input value	1	2	3	4	5			50	86
Output value						36	75		

- e) Describe by means of a formula how the input and output values are related. Use the letter y for output values and letter x for input values.

Answer: $y = 3(x + 2)$

- f) Give a verbal description of how the input and output values are related.

Answer: Add 2 to the input value and then multiply the sum by 3

- g) Themba wrote the formula $y = (x + 2)3$ to describe how the input and output values are related. Is Themba correct? Explain.

Answer: Yes, Themba is correct. The formula $y = 3(x + 2)$ and $y = (x + 2)3$ are one and the same. The formula $y = (x + 2)3$ should, by convention, be written as $y = 3(x + 2)$



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

c) **Emphasise that:**

- the output depends on the input.
- learners consider the input and output values when searching for relationships.
- functional relationships can have more than one operator.
- a relationship in which the value of one variable varies with changes in the values of a 2nd variable.

- d) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo Book 2, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework: Sasol-Inzalo Book 2, page 141 numbers 3 and 4



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PROVINCE:	
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SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: FUNCTIONS AND RELATIONSHIPS: EQUIVALENT FORMS (Lesson 3)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to determine, interpret and justify equivalence of different descriptions of the same relationship or rule presented:

- verbally
- in flow diagrams
- in tables
- by formulae
- by equations

3. RESOURCES:

Textbooks, Sasol-Inzalo Book 2.



4. PRIOR KNOWLEDGE:

- Functions and relationships

5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)

Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.

6. INTRODUCTION (Suggested time: 10 Minutes)

Ask learners to write formulae that provide the same information as the verbal representations below. Let them use x for the input value and y for the output value.

- a) Multiply the input value by 11, then subtract 3 to get the output value.

Answer: $y = 11x - 3$

- b) Multiply the square of the input value by 6, then add 4 times the input value to get the output value.

Answer: $y = 6x^2 + 4x$

- c) Add 3 to the input value, then subtract the sum from 50 to get the output value.

Answer: $y = 50 - (x + 3)$

Remind learners that we normally represent the input by one variable and the output by another variable.

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)**Teaching activities**

Guide learners as they work on the activities below. Allow them to copy and work out the answers, then share their solutions in pairs. Conclude with the whole group discussion.

1. Consider the flow diagram below



- a) Use it to complete the table that follows:

Input values	1	2	3	4	5	x
Output values						

Learning activities

(Learners are expected to:)

- discuss with their partners and use the function rule to complete the table



Note: Ensure that learners are able to use the rule to complete the table

e.g. $1 \times 4 - 2 = 2$

$$2 \times 4 - 2 = 6$$

$$3 \times 4 - 2 = 10$$

$$4 \times 4 - 2 = 14$$

$$5 \times 4 - 2 = 18$$

$$x \times 4 - 2 = 4x - 2$$

b) Represent the flow diagram in words.

Answer: To get the output, multiply the input by 4 and subtract 2.

c) Represent the flow diagram in an equation.

Answer: $y = 4x - 2$

- discuss with their partners and represent the flow diagram in words.
- discuss with their partners and represent the flow diagram in an equation.

2. Consider the flow diagram below



a) Use it to complete the table below

Input values	1	2	3	4	5	x
Output values						

Note: Ensure that learners are able to use the rule to complete the table

e.g. $1 \times 3 + 17 = 20$

$$2 \times 3 + 17 = 23$$

$$3 \times 3 + 17 = 26$$

$$4 \times 3 + 17 = 29$$

$$5 \times 3 + 17 = 32$$

$$x \times 3 + 17 = 3x + 17$$

b) Represent the flow diagram in words.

Answer: To get the output, multiply the input by 3 and add 17.

c) Represent the flow diagram in an equation.

Answer: $y = 3x + 17$

- discuss with their partners and use the function rule to complete the table

- discuss with their partners and represent the flow diagram in words.
- discuss with their partners and represent the flow diagram in an equation.



8. CLASSWORK (Suggested time: 15 minutes)

1. For each flow diagram below, represent the information in a formula and in words.

a)



b)



c)



2. Complete the following tables using the flow diagrams provided. Use x for input values and y for output values.

a)



Input values	1	2	3	4	5	x
Output values						

b)



Input values						
Output values	10	15	20	25	30	$5(x + 1)$

c)



Input values	1		3		5	x
Output values		15		31		



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

e) **Emphasise that:**

- any variable maybe used for the input value and a different one for the output value.
- number sentences can be used to determine the rule.
- When the rule is known any input value or output value can be determined through substitution.

f) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo Book 2, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework: Sasol-Inzalo Book 2, Page 142 number 5.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: FUNCTIONS AND RELATIONSHIPS: EQUIVALENT FORMS (Lesson 4)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to determine, interpret and justify equivalence of different descriptions of the same relationship or rule presented:

- verbally
- in flow diagrams
- in tables
- by formulae
- by equations



3. RESOURCES:	Textbooks, Sasol-Inzalo Book 2.
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> Functions and relationships
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>A formula is a description of how the values of a dependent variable can be calculated for any given values of the other variable(s) on which it depends. Use the given formulae to determine the following:</p> <ol style="list-style-type: none"> The area (A) of a rectangle given by the formula $A = L \times B$ if L (length) is $7,5\text{cm}$ and B (breadth) is 4cm. The area (A) of a rectangle given by the formula $A = L \times B$ if L (length) is $7,5\text{cm}$ and B (breadth) is 5cm. The area (A) of a rectangle given by the formula $A = L \times B$ if L (length) is $8,5\text{cm}$ and B (breadth) is 4cm. Identify the variables in a), b) and c)? Which of them is a dependent variable? Which are independent variables? <p>Note: Give learners an opportunity to explain their answers. Focus them on the relationships between the three variables and the influence they have on each other. Guide them to see that the area is dependent on both the length and the breadth.</p>	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)			
Teaching activities			Learning activities (Learners are expected to:)
Let learners complete the table below;			<ul style="list-style-type: none"> complete the table by substituting in the given equations describe the relationships between the corresponding output values in the three columns.
x	$y = -2x - 1$	$y = -2x$	
-4	$-2 \times -4 - 1 = 7$	$-2 \times -4 = 8$	
-3	$-2 \times -3 - 1 = 5$	$-2 \times -3 = 6$	
-2			
-1			
0			
1	$-2 \times 1 - 1 = -3$	$-2 \times 1 = -2$	
2			
3			
4			
Ask learners to compare the corresponding output values in the three columns and describe the relationships between these. Use the middle column as a benchmark.			



8. CLASSWORK (Suggested time: 15 minutes)

a) Complete the table. Write your answers in simple fraction form where appropriate.

x	$y = 2^{x-1}$	$y = 2^x$	$y = 2^{x+1}$
-3			
-2			
-1			
0			
1			
2			
3			
4			

b) Describe the relationships between the corresponding output values in the three columns. Use the middle column as a benchmark.

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

g) **Emphasise that:**

- the output depends on the input.
- learners consider the input and output values when searching for relationships.
- functional relationships can have more than one operator.

h) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Homework: Carefully select appropriate activities from the Sasol-Inzalo Book 2, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.



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GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
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DATE:	
DURATION:	1 Hour

1. TOPIC: FUNCTIONS AND RELATIONSHIPS: EQUIVALENT FORMS (Lesson 5)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to determine, interpret and justify equivalence of different descriptions of the same relationship or rule presented:

- in tables
- by formulae
- by equations



3. RESOURCES:	Textbooks, Sasol-Inzalo Book 2.																		
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none">• Functions and relationships																		
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)																			
<p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>																			
6. INTRODUCTION (Suggested time: 10 Minutes)																			
<p>Consider rectangles which each have an area of 24 square units. The breadth of the rectangles (y) varies in relation to the length (x) according to the formula $xy = 24$.</p>																			
a) Complete the table to represent this situation.																			
<table><tr><td>Length (x)</td><td></td><td></td><td></td><td></td><td>6</td><td>8</td><td>12</td><td>24</td></tr><tr><td>Breadth (y)</td><td>24</td><td>12</td><td>8</td><td>6</td><td></td><td></td><td></td><td></td></tr></table>		Length (x)					6	8	12	24	Breadth (y)	24	12	8	6				
Length (x)					6	8	12	24											
Breadth (y)	24	12	8	6															
b) Is the length dependent on the breadth in this situation? Explain.																			
<p>Answer: yes. The value of the breadth determines the value of the length and vice versa. In this case the area is fixed and therefore independent of both the length and the breadth. This is an example of indirect proportion (as the length increases, the breadth decreases and vice versa, while the area remains constant).</p>																			

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)														
Teaching activities								Learning activities (Learners are expected to:)						
1) Consider rectangles with a fixed perimeter of 24 units. The breadth of the rectangles (y) varies in relation to the length (x) according to the formula $2(x + y) = 24$. Complete the table to represent this situation.								<ul style="list-style-type: none">Complete the table working as individuals and then in pairs.Solve the equations by inspection and substitutionShare solutions in pairs						
Length (x)	1	2	3	4	5	6								
Breadth (y)							5					4	3	2
Note: Learners can solve the equations by inspection e.g. to get 24 <ul style="list-style-type: none">you must multiply 2 by 12. y then should be 11 so that $x + y$ gives 12.From $2(x + y) = 24$ $x + y = 12$ $\therefore y = 11$ since $x = 1$														



2) The formula $b = 180^\circ - \frac{360^\circ}{n}$ gives the size b of each interior angle in degrees for a regular polygon with n sides (an n -gon).

a) Complete the table below.

Number of sides (n)	3	4	5	6	10	12
Angle size (b)						

b) What is the size of each interior angle of a regular polygon with 20 sides, and a regular polygon with 120 sides?

c) If each interior angle of a polygon is 150° , how many sides does it have?

- Complete the table working as individuals and then in pairs.
- Solve the equations by inspection and substitution
- Share solutions in pairs

8. CLASSWORK (Suggested time: 15 minutes)

As you may know, metals contract when temperatures are low and expand when temperatures are high. So, when engineers build bridges they always leave small gaps in the road between sections to allow for heat expansion. For a certain bridge, engineers use the formula $y = 2,5 - 0,05x$ to determine the size of the gap for each 1°C rise in temperature, where x is the temperature in $^\circ\text{C}$.

a) Complete the table below to show the size of the gap at different temperatures:

Temperature ($^\circ\text{C}$)	3	4	10	15	25	30	35
Gap size (cm)							

b) What is the size of the gap at each of the temperatures shown below?

0 $^\circ\text{C}$ 18 $^\circ\text{C}$ -2 $^\circ\text{C}$ 50 $^\circ\text{C}$

c) At what temperature will the gap close completely?

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

i) **Emphasise that:**

- the output depends on the input.
- learners must consider the input and output values when searching for relationships.
- functional relationships can have more than one operator.



- j) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo Book 2, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework: Sasol-Inzalo Book 2 on page 146, number 6.



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DISTRICT:	
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DATE:	
DURATION:	1 Hour

1. TOPIC: FUNCTIONS AND RELATIONSHIPS: EQUIVALENT FORMS (Lesson 6)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to determine, interpret and justify equivalence of different descriptions of the same relationship or rule presented:

- verbally
- in flow diagrams
- in tables
- by formulae
- by equations

3. RESOURCES:

Textbooks, Sasol-Inzalo Book 2.



4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> Functions and relationships
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION (Suggested time: 10 Minutes) Present the following problem to learners: The formula $y = 0,0075x^2$, where x is the speed in <i>km</i> per hour and y the distance in metres, is used to calculate the braking distance of a car travelling at a particular speed. Use a calculator for this question. What is the braking distance if someone drives at 80 kilometres per hour? Give learners time to work on the problem on their own and then allow a discussion. Answer: On the scientific calculator you must punch in 0,0075 followed by \times sign followed by (80) followed by x^2 . The calculator will do the following: $y = [0,0075 \times (80)^2] = (0,0075 \times 6\,400) = 48$ \therefore The braking distance is 48 m.	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)																	
Teaching activities	Learning activities (Learners are expected to:)																
<p>Questions below are based on the introduction above. Let learners work on them in pairs, each writing in his own book.</p> <p>a) What is the braking distance at a speed of 100 kilometres per hour?</p> <p>b) Calculate the braking distance at a speed of 60 kilometres per hour.</p> <p>c) Complete the table below. Give answers to two decimal places where necessary.</p> <table><tr><td><i>Speed in km/h</i></td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td></tr><tr><td><i>Braking distance in m</i></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	<i>Speed in km/h</i>	10	20	30	40	50	60	70	<i>Braking distance in m</i>								<ul style="list-style-type: none">work in pairs. Report on how they have worked out their solutions.
<i>Speed in km/h</i>	10	20	30	40	50	60	70										
<i>Braking distance in m</i>																	



- d) Refer to the table in question (c) to answer this question. A car travels at a speed of 40 kilometres per hour. A sheep 7 m away on the side of the road suddenly runs onto the road. Will the car hit the sheep or will the driver be able to stop the car before it hits the sheep? Explain.
- e) A car travels at a speed of 90 km/h in an area that has school children crossing the road. What distance does the driver need to stop the car so that it does not hit the children?

- work in pairs.
- report on how they have worked out their solutions.

8. CLASSWORK (Suggested time: 15 minutes)

- a) Use the formula $y = 1,06x$ to complete the table below.

x	100	200	300	400	500	1 000	5 000	10 000
y								

- b) What is the value of y if $x = 750$?
- c) What is the value of y if $x = 2\,500$?
- d) Represent the formula $y = 1,06x$ by means of a flow diagram.
- e) If $y = 583$, what is the value of x ?
- f) If $y = 954$, what is the value of x ?
- g) The statement $1\,060 = 1,06x$ is given. For what value of x is the statement true?
- h) The statement $530 = 1,06x$ is given. For what value of x is the statement true?

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo Book 2, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework: Sasol-Inzalo Book 2 page 148 number 12.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: ALGEBRAIC EQUATIONS (Lesson 1)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to:

- set up equations to describe problem situations
- analyse and interpret equations that describe a problem situation
- solve equations by inspection
- solve equations using additive and multiplicative inverses
- solve equations using laws of exponents



3. RESOURCES:	Sasol-Inzalo Workbook, DBE Workbook, textbooks
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • solve simple equations • substitute values into equations • use tables to represent input and output values • additive and multiplicative inverses
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Activity 1 (revision of Term 1 and 2 equations)</p> <p>Discuss the additive and multiplication inverses by completing with the learners the following activity in order to revise these concepts:</p> <p>(i) State the additive inverses of the following:</p> <ol style="list-style-type: none"> 5 - 5 17 0,1 $\frac{5}{6}$ <p>(ii) State the multiplicative inverses of the following:</p> <ol style="list-style-type: none"> 5 -5 $\frac{5}{6}$ $\frac{1}{8}$ 	



Activity 2 (Term 1 and 2 revision)

The aim of this activity is to remind learners of different methods to solve equations once you have represented the problem situation as an equation, and should be done as a whole class discussion.

Solving Equations by Inspection

- | | | |
|---|--------------------------|---|
| 1 | $2x + 3 = 21$ | - additive inverse; divide on both sides |
| 2 | $\frac{x}{2} + 5 = 30$ | - multiply all terms by LCM of 2, then additive inverse method |
| 3 | $(x - 4) \div 3 + 2 = 6$ | - multiply all terms by LCM of 3 , then additive inverse method |
| 4 | $20 - 3n = 2$ | - additive inverse; divide on both sides |
| 5 | $3^x = 27$ | - trial and improvement, exponents |
| 6 | $2^x = 64$ | - trial and improvement, exponents |

NB : emphasise checking of the solution to test the answer by substitution into the equation



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to:)																								
<p>This activity is aimed at showing learners the rationale behind algebraic equations in order to solve real life problem situations.</p> <p>Activity: Farmer Moola has already planted 100 apple trees and 250 orange trees on his fruit farm. He decides to plant 20 more apple trees every day, as can be seen in the table below:</p> <table><tr><td>Number of days (x)</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Number of trees (y)</td><td>100</td><td>120</td><td>140</td><td>160</td><td></td></tr></table> <p>He also decides to plant 10 orange trees a day, as shown below:</p> <table><tr><td>Number of days (x)</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Number of trees (y)</td><td>250</td><td>260</td><td>270</td><td>280</td><td></td></tr></table> <p>a. Determine a rule for calculating the number of apple trees after x days. Express the rule as a formula, and represent the number of apple trees with y.</p> <p>- Trees increase from 100 by 20 each day, hence, $y = 20x + 100$</p> <p>b. Write the formula for finding the number of orange trees after x days.</p> <p>- In this case orange trees increase from 250 by 10 each day : $y = 10x + 250$</p> <p>c. How many orange trees will there be on the 14th day? $y = 10(14) + 250 = 140 + 250 = 390$ orange trees</p> <p>d. After how many days will farmer Moola have 260 apple trees? $y = 20x + 100$ $260 - 100 = 20x + 100 - 100$ $160 = 20x$ (which number when multiplied by 20 will give 160? *8 ! Inspection! $8 = x, or x = 8$, hence after 8 days</p>	Number of days (x)	0	1	2	3	4	Number of trees (y)	100	120	140	160		Number of days (x)	0	1	2	3	4	Number of trees (y)	250	260	270	280		<p>Learners complete with the teacher</p>
Number of days (x)	0	1	2	3	4																				
Number of trees (y)	100	120	140	160																					
Number of days (x)	0	1	2	3	4																				
Number of trees (y)	250	260	270	280																					



1. CLASSWORK (Suggested time: 15 minutes)

- (a) Solve for x in $2x + 5 = 55$
- (b) Solve for x in the equation : $3x + 1 = 27$
- (c) $\frac{x}{3} + 5 = 11$
- (d) $(x - 4) \div 3 + 2 = 6$
- (e) $11 - 3n = 2$
- (f) Page 152, SASOL-INZALO WORKBOOKS, Numbers 2, 3, 4
- (g) DBE workbook Page 111 Worksheet 111

8. NSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

Emphasise that:

Real life problem situations can be represented using algebraic equations

There are different methods/strategies to solve equations such as:

- Multiplicative and additive inverses
- Solving by inspection which calls for mental Maths, as well as trial and improvement

The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

1. Solve the equations:
2. $8x - 3 = 13$
3. $3x + 15 = 0$
4. $8m - 1 = 23 - 4m$
5. $2m - 4 + 3m = 7m - 12$
6. $0,2b + 0,9 = 0,3 - 0,1b$
7. Solve for x in the equation : $2^{x+1} = 4$
8. Solve for x in the equation : $5^{2x+1} = 125$
9. Page 152, SASOL INZALO WORKBOOKS, Numbers 5, 6



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: ALGEBRAIC EQUATIONS (Lesson 2)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to

- Determine the numerical value of an expression by substitution
- Use substitution in equations to generate tables of ordered pairs



3. RESOURCES:	Sasol Inzalo Workbook, DBE Workbook, Textbooks			
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none">• solve simple equations• .substitute values into equations• use tables to represent input and output values			
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)				
Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.				
6. INTRODUCTION (Suggested time: 10 Minutes)				
This introduction consolidates the work done on functions as well solving simple equations. Hence the strategies for solving equations learnt in previous lessons will apply.				
Discuss and revise with your learners the input and output values:				
Example 1				
Use the flow diagram below to determine the output values in the table which follows:				
a) Flow diagram:				
<div>Input values</div> <div><div><div>←</div><div>× 2</div><div>→</div></div><div><div>+ 1</div><div></div><div>→</div></div><div>output values</div></div>				
b) TABLE :				
INPUT VALUES	-1	0	1	2
OUTPUT VALUES	-1	1	3	5
c) Description in words: let learners verbalise the rule, that is, multiply the input values by 2 and add 1 (note that the difference in the output values is 2)				
d) SYMBOLIC FORM (equation)				
$y = 2x + 1$				
e) Let the learners substitute the input values in the equation in order to verify their output values.				



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to 😊)																								
<p>Activity 1</p> <p>1. Let learners complete the following table below for x and y values for the equation $y = -3x + 2$, by substitution:</p> <table><tr><td>x</td><td>-3</td><td>-1</td><td>0</td><td></td><td></td></tr><tr><td>y</td><td></td><td></td><td></td><td>-4</td><td>-10</td></tr></table> <p>2. Complete the following table below for x and y values for the equation $y = x^2 - 2$</p> <table><tr><td>x</td><td>-3</td><td>-2</td><td>0</td><td></td><td></td></tr><tr><td>y</td><td></td><td></td><td></td><td>-2</td><td>2</td></tr></table> <p>The co-ordinate notation for the step above is $(x; y)$, we start by writing the x value first, followed with the y value next/second. This is called an ordered pair.</p> <p>Hence writing the co-ordinate notation for the table (in table 1) is: $(-3; 11)$; $(-1; 5)$, etc. The principle of order is important and learners understand this fact.</p> <p>Ordered pairs</p> <p>Consider the following relationship between two variables, x and y: $y = 2x - 1$</p> <p>The value of y will depend on what the value of x is</p> <p>For example, if $x = 3$, then the value of y will be $y = 2(3) - 1 = 6 - 1 = 5$</p> <p>In the relationship $y = 2x - 1$, x is called the independent variable, because any value for x can be chosen randomly or independently. However, y is called the dependent variable, because the value of y depends on the value of x</p> <p>We will select a few values for x and then calculate the values of y corresponding to these values of x. We will use a table to represent the information. Each value of x and its corresponding y value can be written in ordered pairs</p>	x	-3	-1	0			y				-4	-10	x	-3	-2	0			y				-2	2	
x	-3	-1	0																						
y				-4	-10																				
x	-3	-2	0																						
y				-2	2																				



Activity 2

Determine the value for y for the given values of x if $y = 2x - 1$

$-x$	-2	-1	0	
y	-5	-3	-1	1

Write the outcome as ordered pairs:

$\{(-2; -5); (-1; -3); (0; -1); (1; 1); (2; 3)\}$

Activity 3:

Determine the value for y for the given values of x if $y = 3x$

$-x$	-2			1
y		-3	0	

Write the outcome as ordered pairs:

8. CLASSWORK (Suggested time: 15 minutes)

- a) Complete the table if $y = x - 3$: and express the table as an ordered pair.

x	-2	-1	0	1	2	5
y						

- b) Given the rule $y = 2x + 3$ find the input and output values: and express the table as an ordered pair.

Input values (x)	1	2	3			9			
Output values (y)	5	7		11	15		25	37	51

- c) Look at the table of x and y values below: and express the table as an ordered pair.

x	0	1	2	3	4	5	6	10	15	50	100
y	2	3	4	5	6	7					

- (i) Write an equation to define the relationship between x and y in the table.
 (ii) Use the equation to find the missing y -values.
 d) Page 153, SASOL INZALO WORKBOOKS, Numbers 1 - 3



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

k) Emphasise:

- Equivalent forms
- That the co-ordinate notation for the step above is $(x; y)$, we start by writing the x value first, followed with the y value next/second. This is called an **ordered pair**.

- l) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

Activity 1

Determine the value for y for the given values of x if $y = 2x^2$

$-x$	-2	-1	0	1	2
y	8	2	0	2	8

Write the outcome as ordered pairs:

$\{(-2; 8); (-1; 2); (0; 0); (1; 2); (2; 8)\}$

Activity 2:

If the rule to get the y -values is $y = 2x - 3$, use this rule/equation to complete the table for the integer x -values from 0 to 6. Write your answers in ordered pairs, that is $(x; y)$.

Activity 3:

Page 155, SASOL INZALO WORKBOOK, Numbers 3 a – e

Page 155, SASOL INZALO WORKBOOK, Numbers 1 - 2



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: ALGEBRAIC EQUATIONS (Lesson 3)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to use substitution in equations to generate tables of ordered pairs



3. RESOURCES:	Sasol-Inzalo Workbook, DBE Workbook, textbooks												
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none">• solve simple equations• .substitute values into equations• use tables to represent input and output values												
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)													
Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.													
6. INTRODUCTION (Suggested time: 10 Minutes)													
Activity 1:													
In each of the following flow diagrams, the rule describes the relationship between the input values (x) and the output (y):													
<div><div><div>1. Describe the rule in words</div><div>2. Use number sentences to calculate the output value for each input value:</div></div><div><div><div><div>-2</div><div>-4</div><div>-8</div><div>-16</div><div>-20</div></div><div><div>$\frac{x}{2} - 2$</div></div><div><div><div></div><div></div><div></div><div></div><div></div></div></div></div></div></div>													
3. Complete the table to show the relationship between the input and output values.													
<table><tr><td>Input values (x)</td><td>-2</td><td>-4</td><td>-8</td><td>-16</td><td>-20</td></tr><tr><td>Output values (y)</td><td></td><td></td><td></td><td></td><td></td></tr></table>		Input values (x)	-2	-4	-8	-16	-20	Output values (y)					
Input values (x)	-2	-4	-8	-16	-20								
Output values (y)													
4. Express the table above as order pairs of the values of x and y .													



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

A. Using tables to find input and output values (ordered pairs):

Learners already know that the input and the output numbers/values can be given in a table.

Activity 1:

Determine the rule for the following input and output values. Then find the missing output values in the table below:

Input values (x)	1	2	3		5			20		50
Output values (y)	3	5		9		15	17	41	51	

In this table learners should verify that for every value of x there is a corresponding value of y . That is, if $x = 1$, then $y = 3$, also if $x = 2$ then $y = 5$.

The co-ordinate notation for the step above is $(x; y)$, we start by writing the x value first, followed with the y value second. This is called an **ordered pair**.

Hence writing the co-ordinate notation for the table is: $(1; 3)$; $(2; 5)$, etc. The principle of order is important and learners understand this fact.

Activity 2

Determine the rule/equation for the following input and output values. Then find the missing output values in the table below:

Input values (x)	1	2	3	4	5	6	7	8	9	10
Output values (y)	5	9	13							



B. We can find output values if relationships are described in a formula, in a flow diagram, in a table or in an equation, hence for every value of x there is a corresponding value of y .

Example 1: the formula to describe the relationship between the scoops of ice cream and the people is
 x (no of people) $\rightarrow 2 \rightarrow y$ (number of scoops) $\therefore y = 2x$

Activity 1:

Write 5 ordered pairs for the above problem situation, that is $(x; y)$.
 For e.g. $(1; 2), \dots$

Activity 2:

Given the formula $y = \frac{1}{3}x + 2$; find all the missing y - values

x	-12	-6	0	3	6	9
y						

Activity 3:

Look at the table below:

x	1	2	3	4	5	6	10	15	50	100
y	4	6	8	10	12					

1. Write an equation to define the relationship between x and y in the table.
2. Use the equation to find the missing y -values.



9. CLASSWORK (Suggested time: 15 minutes)

Activity 1: The relationship between x and y is given by the following:

x multiplies by 4, then subtract 3 from the answer to get y .

1. Complete the table :

x	1	2	3	4	5	6	10	15	50	100
y										

2. Write an equation that defines the relationship between x and y in the table.

Activity 2

Determine the value for y for the given values of x if $y = -x^2$

$-x$	-3	-1	0	2	3
y					

Write the outcome as ordered pairs:

Activity 3

Which of the following ordered pairs will meet the requirements for $y = -2x + 1$?

$-x$	-2	-1	0	1	2
y	-3	3	-1	-1	-3

Answer: $\{(-1; 3); (1; -1); (2; -3)\}$

Activity 4

Page 156, SASOL INZALO WORKBOOKS, Numbers 1 - 3

Page 157, SASOL INZALO WORKBOOKS, Numbers 1 - 5

10. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

m) Emphasise:

- Equivalent forms
- Ordered pairs

n) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GRAPHS INTERPRETING GRAPHS (Lesson 1)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to analyse interpret global graph of problem situations with special focus on linear or non-linear.



3. RESOURCES:	DBE Book 2, Sasol-Inzalo Book 2, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • Cartesian plane • x- and y-axis, point of origin (0; 0) • ordered pairs (coordinates) and quadrants
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Do the following activity with learners:</p> <p>Activity</p> <p>Study the following set of sequence and answer the questions that follow:</p> <p>1. 1, 3, 5, 7,...</p> <p>a) Give the next two terms in the sequence. b) Explain what you did to get to your answer. c) Will you describe the change as constant?</p> <p>2. 1, 4, 9, 25, 36,</p> <p>a) Give the next two terms in the sequence. b) Explain what you did to get to your answer. c) Will you describe the change as constant?</p> <p>Discussion:</p> <ul style="list-style-type: none"> • a constant rate change is when the rate of increase are the same. • when the rate of change changes the rate is no longer constant. • a constant rate is described as a linear pattern • a changing rate is describes as a non-linear pattern. 	



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities

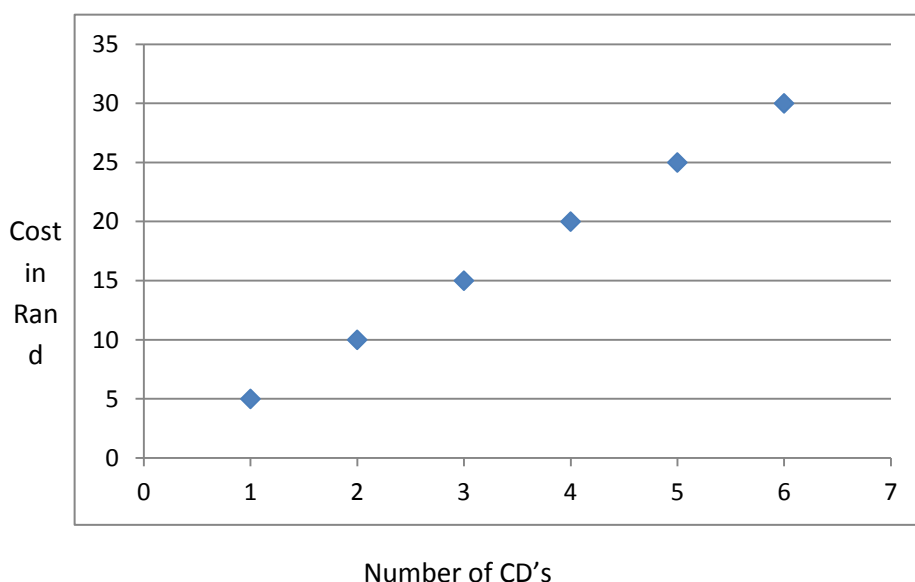
Learning activities (Learners are expected to:)

Activity1

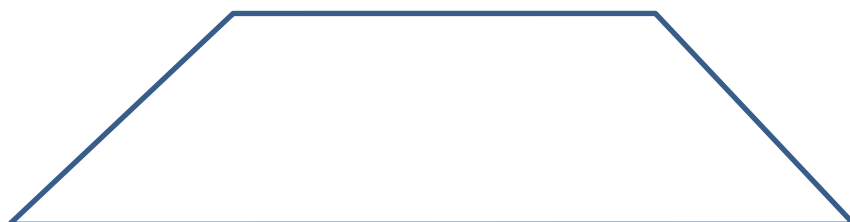
Demonstrate the following situations and sketch graphs depicting the situations.

- a) A CD (compact disk) cost R 5. The following table show the relationship between the number of CD's and the cost. Complete the table and represent it on the graph.

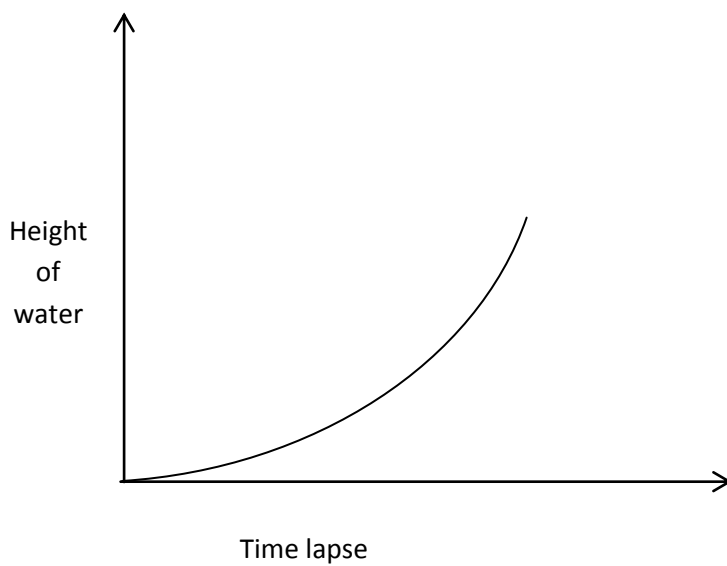
No of CD's sold	0	1	2	3	4	5	6	7
Cost of CD's	5							



- b) Fill the following jar is filled with water at a steady speed. Note the time taken and the height of the water level as the jar is filled.



observe the demonstrations and explain what they observe.



Ask learners the following questions to disclose their observations:

- Describe the shape of the two graphs.
- Did the cost of the CD's change as more CD's were bought?
Explain your observation.
- Did the height increase at the same rate as the water was poured into the jar? Explain your observation.

Discussion:

- when the rate of change is constant the graph will be linear.
- when the rate of change is not constant but changing the graph will be non-linear.

8. CLASSWORK (Suggested time: 15 minutes)

Sasol-Inzalo Book 2 page 166, no 2
DBE Book 2 page 141, no 1 a-d

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

o) **Emphasise that:**

- Linear graph means points joined to form a straight line
- Non – linear means points joined to form a curved line

- p) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

Sasol-Inzalo Book 2 page 166, no 3,4



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

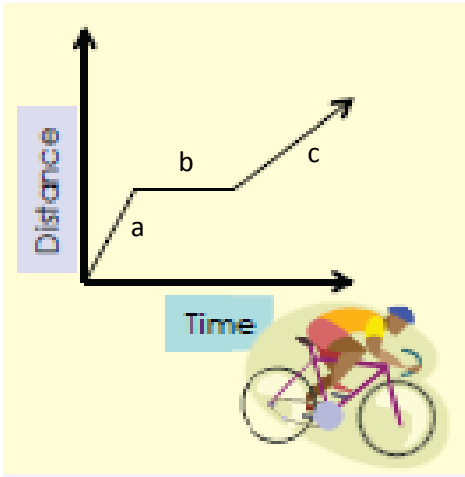
PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GRAPHS: INTREPRETING GRAPHS (Lesson 2)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to analyse and interpret global graphs with a special focus on constant, increasing or decreasing

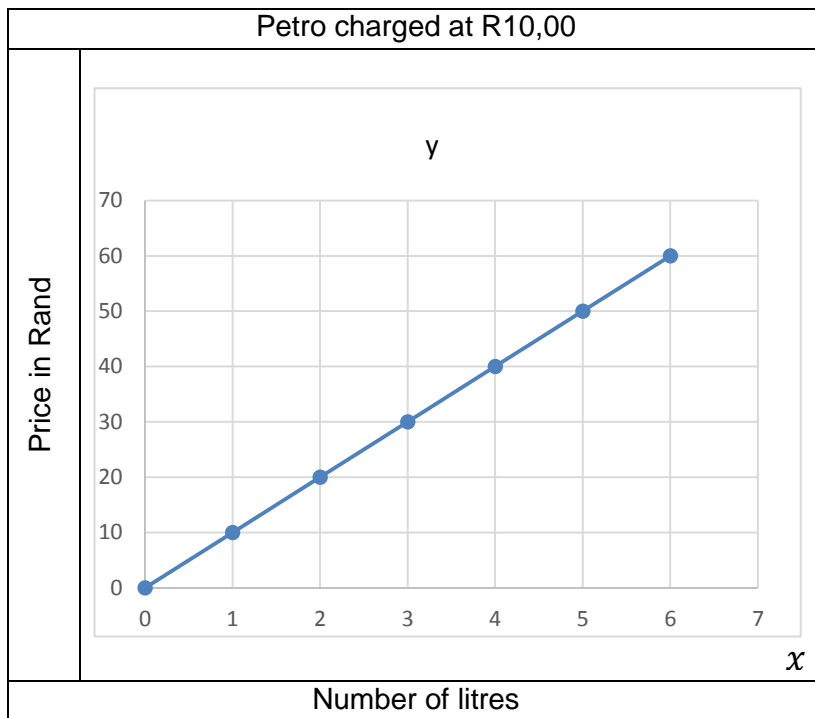


3. RESOURCES:	DBE Book 2, Sasol-Inzalo Book 2, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> Linear and non - linear graphs
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Allow learners to study the graph below and discuss</p>  <p>Ask the following questions:</p> <ol style="list-style-type: none"> Name the two variables that are in relation with each other in this problem situation. Explain the change in the time and the distance in each of the sections a, b and c. Is the graph linear or non-linear? <p>Solution</p> <ol style="list-style-type: none"> Time lapse & distance covered a) Both time and distance increase , b) Time increases but the distance does not, c) Time and distance increase Linear <p>Refer to DBE book 2 page 141</p>	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)	
Teaching activities	Learning activities (Learners are expected to

Activity 1

Allow learners to work in pairs to study the graph below and discuss



Work in pairs to study the graph discuss and answer questions.

Answer the following questions

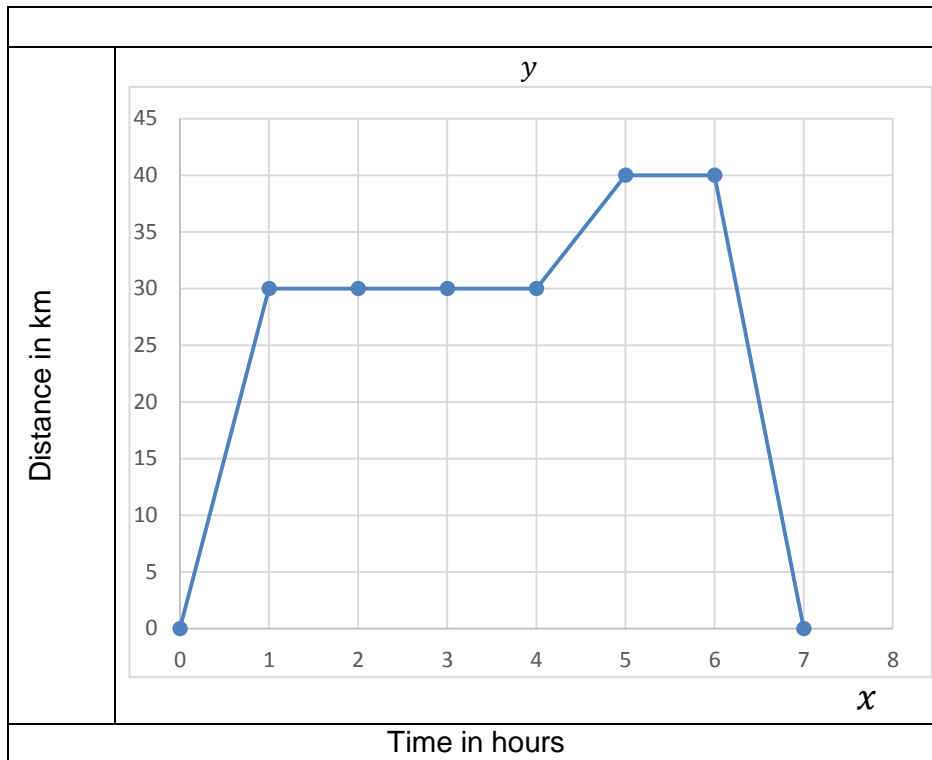
4. What information is given in the x-axis?
5. What information is given in the y-axis?
6. Relate a story on what is the graph representing
7. Is the graph linear or non-linear

Solution

4. Litres of petrol
5. Price of petrol
6. One possible story could be correct
7. Linear (increasing)

Activity 2

Study the graph below and answer the questions



Answer the following questions

8. What information is given in the x-axis?
9. What information is given in the y-axis?
10. What happens within the first hour?
11. What happens between the second and four?
12. Relate a story on what is the graph representing
13. Is the graph linear or non-linear?

Solution

8. Time in hours
9. Distance in *km*
10. One possible story could be correct
11. Linear (increasing, constant and decreasing)

8. CLASSWORK (Suggested time: 15 minutes)

Sasol Inzalo book 2 page 56 4 and 5



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

q) **Emphasise that:**

- **Constant:** A line is constant when the y-value remains the same while the x-value increases.
- **Increasing:** The slope of a line increases when the y-value increases while the x-value increases.
- **Decreasing:** The slope of a line decreases when the y-value decreases while the x-value increases

- r) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

Sasol Inzalo book 2 page 56 6 and 7



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

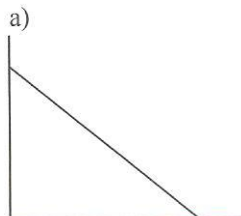
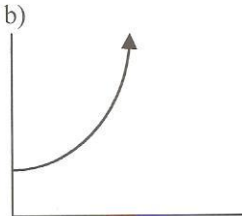
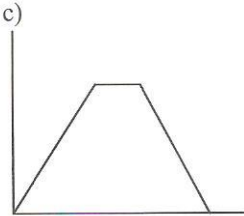
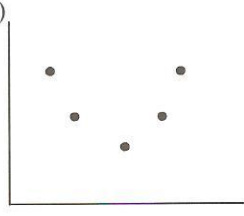
PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hours

1. TOPIC: GRAPHS: INTERPRETING GRAPHS (Lesson 3)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to analyse and interpret global graphs of problem situations with the focus on features of graphs to include maximum or minimum.



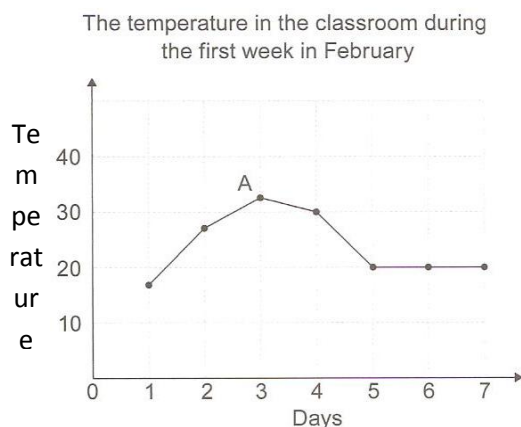
3. RESOURCES:	DBE book 2, Sasol-Inzalo book 2 ,textbooks.
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> linear and non-linear graphs constant, increasing, and decreasing graph
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)	
<p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes)	
<p>1. Let learners work in pairs to identify which graphs below are linear , non-linear , constant increasing or decreasing</p>	
<p>a)</p>  <p>_____</p>	<p>b)</p>  <p>_____</p>
<p>c)</p>  <p>_____</p>	<p>d)</p>  <p>_____</p>

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)	
Teaching activities	Learning activities (Learners are expected to:)



Activity 1

Ask learners to study the graph below and discuss it in pairs and answer questions that follow:



- During which days were there an increase in temperature?
- During which days were there a decrease in temperature?
- During which days were temperature unchanged?
- What do you think is happening at point A?

Discussions:

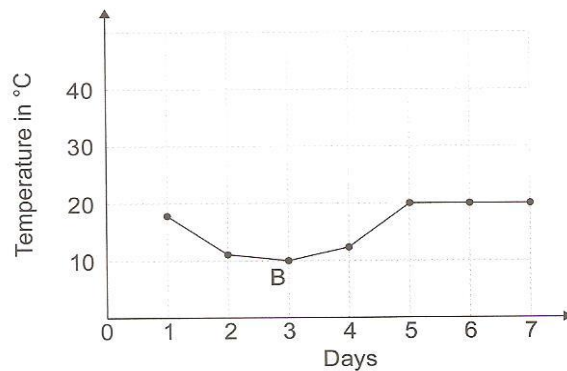
- at point A, the graph reaches its highest y -value of 33°C .
- note that the graph increases until it reaches the maximum point, and then decreases.

Activity 2

Ask learners to study the graph below and discuss it in pairs and answer questions that follow:



The temperature in the classroom during the first week in June



- During which days were there a decrease in temperature?
- During which days were there an increase in temperature?
- During which days were temperature unchanged?
- What do you think is happening at point B?

Discussions

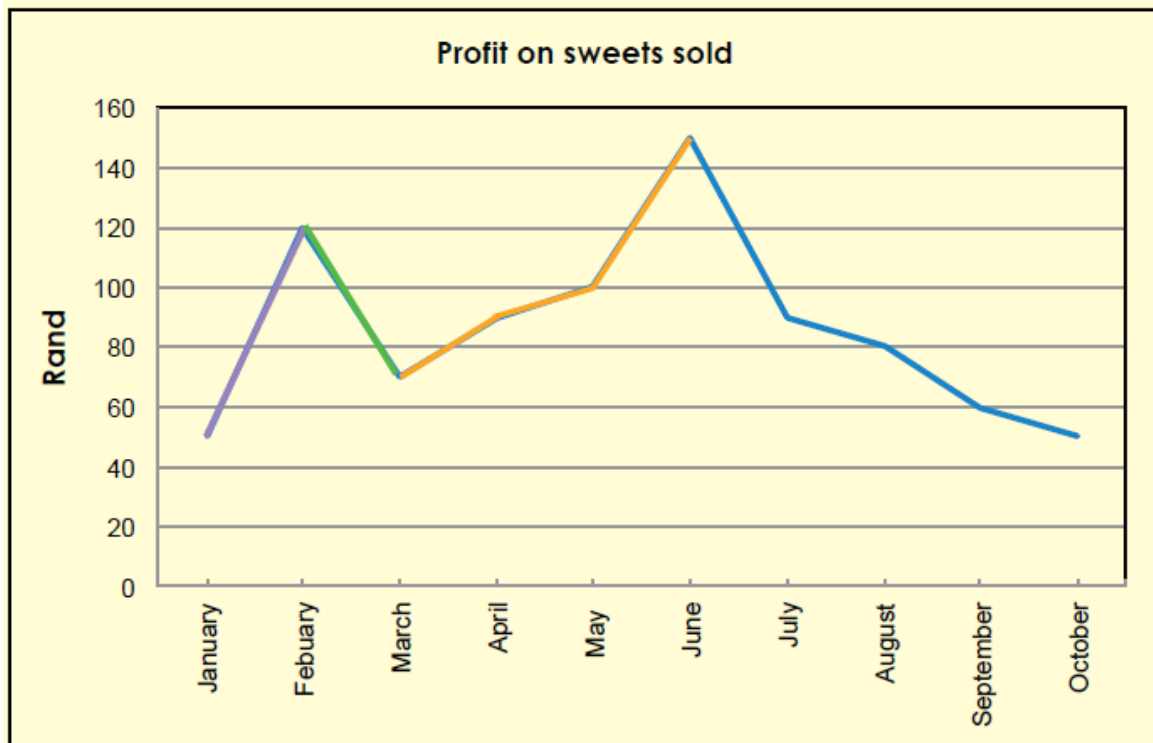
- at point B, the graph reaches its lowest y -value of 10°C .
- this point is called a minimum point.
- the graph decreases until it reaches the minimum point, then increases

8. CLASSWORK (Suggested time: 15 minutes)

Sasol-Inzalo Book 2 page 167 number 1 and 2

Question 2

Study the graph below and answer the questions that follow.



- a) During which months were there a decrease profit made?
- b) During which months were there an increase profit made?
- c) During which month was the maximum profit made?
- d) What is the profit made at this maximum profit?
- e) During which months were the minimum profit made?

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)



s) **Emphasise that:**

- A graph has a maximum value when it changes from increasing to decreasing.
- A graph has minimum value when it changes from decreasing to increasing.

- t) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

DBE Book 2 page 138 number 1, SASOL Book 2 page 161



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GRAPHS: INTERPRETING GRAPHS (Lesson 4)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to analyse and interpret global graphs of problem situations, with a special focus on discrete or continuous.



3. RESOURCES:	DBE Book 2, Sasol-Inzalo Book 2, textbooks
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • linear, non-linear • constant increase, decrease • minimum, maximum • system of axes
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Have a discussion the difference between discrete data and continuous data.</p> <p>Discrete data</p> <ul style="list-style-type: none"> • unconnected • can be counted • can be grouped • can only take on a certain value <p>Continuous data</p> <ul style="list-style-type: none"> • uninterrupted • connected • measurable • can take on any value <p>Use the following examples to explain the difference between discrete and continuous data.</p> <ol style="list-style-type: none"> Number of pets a learner can have Height of a tree as it grows over a period of time <p>Give learners the following to discuss in pairs and report back to the class.</p> <ol style="list-style-type: none"> Shoe sizes of learners in class Number of rabbits observed in a field study Number of text message send today The level of lead in drink water Number of goals scored in a soccer match The change in teachers pockets Number of books in your school bag A cell phone company's charge on time of a phone call. 	



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities

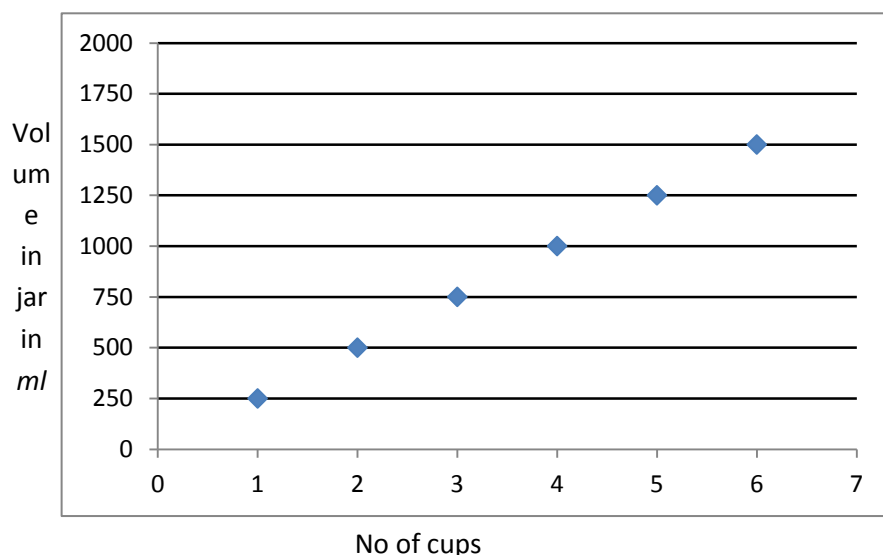
Learning activities (Learners are expected to:)

Pose the following problem situations to learners and with their assistance sketch the graphs and interpret the graphs. Give special focus on whether the graph is discrete or continuous.

Activity 1

Fill a big jar with water. Add the water with a cup that contains 250 ml of water. Complete the table and sketch the graph.

No of cups added	1	2	3	4	5	6
Volume of water in the jar in ml	250					

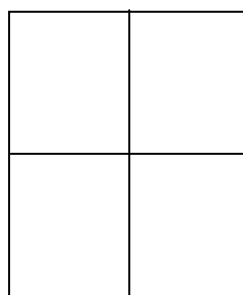
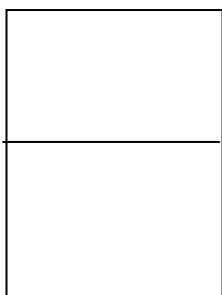
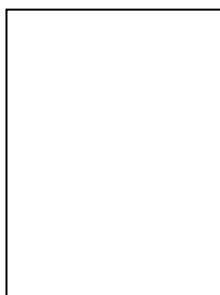


- Can a half cup of water be added? Explain your answer.
- Is the data in this experiment discrete or continuous?
- Will it make sense to join the points?
- Can you read from the graph how much water will be in the jar when 7 cups of water is added?
- Read off the number of cups that must be added to have a volume of 625 ml.

Activity 2

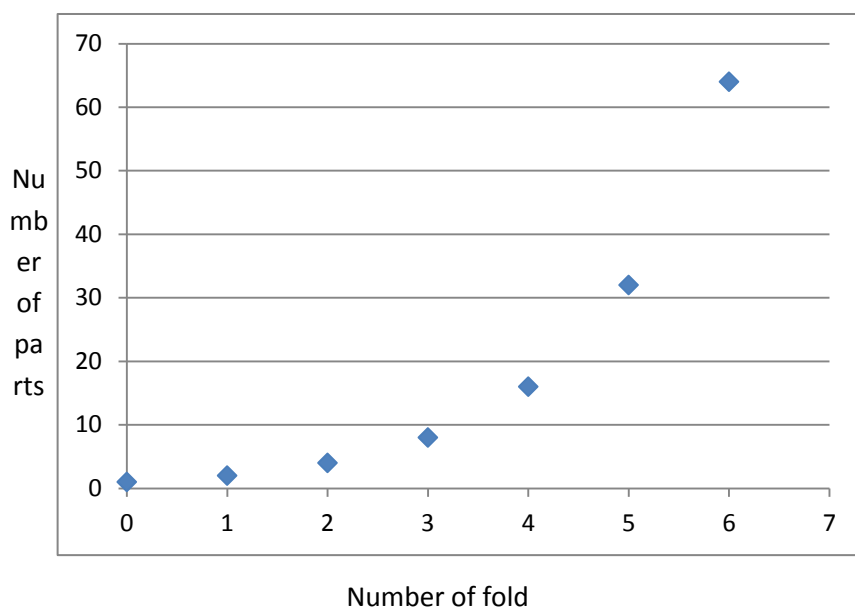
Take a sheet of A4 paper and fold it in two to get two A5 sized parts as shown in the diagram. Now fold again to get four A6 sized parts and so on.





- a) Complete the following table and draw a graph to represent the values you obtained in the table above.

Number of folds	0	1	2	3	4	5
Number of parts	1	2	4			



- b) Can we have a half a fold?
 c) Will it make sense to join the points?
 d) Is the data discrete or continuous?

Discussion:

- when data is continuous we can join the points with a line because the graph holds true for all values in between
- when data is discrete the points cannot be joined because the graph does not hold true for the values in between.

8. CLASSWORK (Suggested time: 15 minutes)

Sasol-Inzalo pg. 168, no 1,2

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

a) **Emphasise that:**

- u) when data is continuous we can join the points with a line because the graph holds true for all values in between
- v) when data is discrete the points cannot be joint because the graph do not hold true for the values in between.

- b) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

Sasol-Inzalo pg. 169 -170, no 1,2



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GRAPHS: DRAWING OF GRAPHS (Lesson 5)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to draw global graphs from given descriptions of a problem situation, identifying linear or non-linear, constant, increasing or decreasing, maximum and minimum, discrete or continuous.



3. RESOURCES:	DBE workbook, Sasol-Inzalo, textbooks
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • features of graphs i.e. non-linear, constant, increasing, decreasing, maximum or minimum, discrete or continuous • system of axes
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	



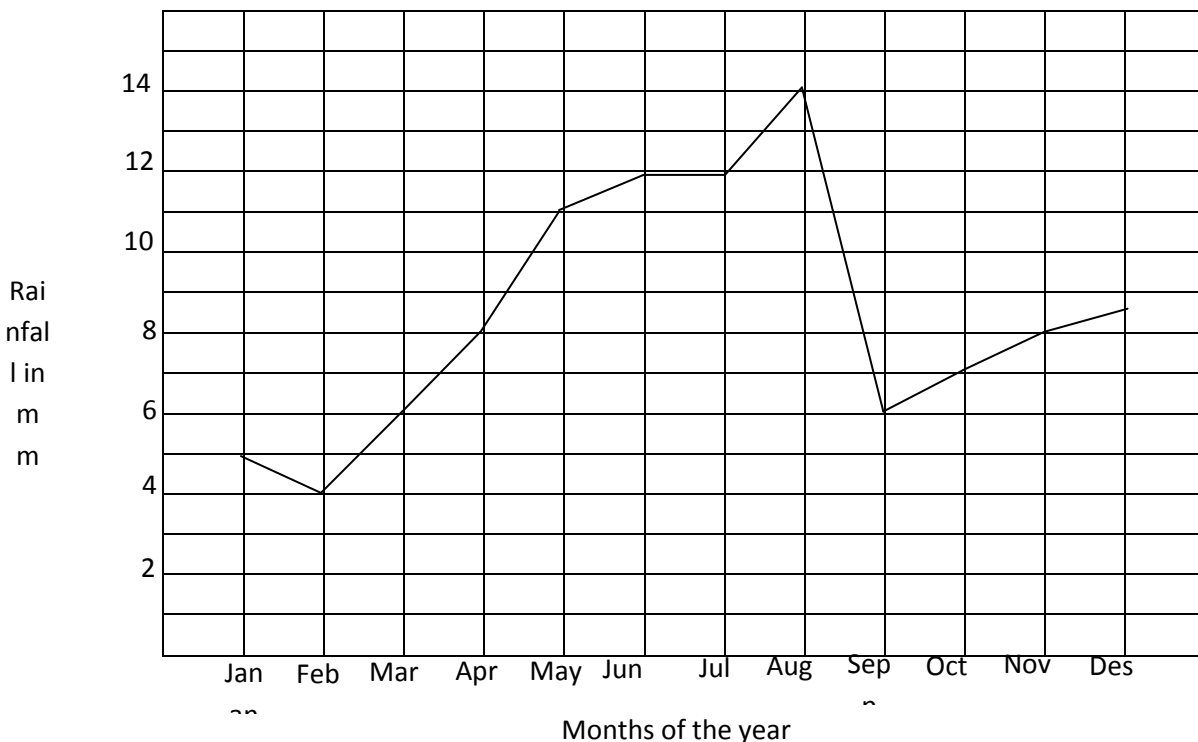
6. INTRODUCTION (Suggested time: 10 Minutes)

Revise trends and features of global graphs discussed in previous lessons through the following activity.

Activity

The following graph is a representation of the temperature taken over time in Kuruman.

1. Study the graph and answer the questions that follow:



- What is the maximum rainfall for Kuruman?
- What is the minimum Rainfall for Kuruman?
- What can be said about the rainfall between June and July?
- Between which months were the greatest change in rainfall measured?
- Was the change mentioned in (d) positive or negative?

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to:)
<p>Drawing global graphs</p> <p>Activity 1</p> <p>1. Have a class discussion through the following questions:</p> <ol style="list-style-type: none">Give your understanding of the words dependent and independent. Mention examples.Name the two variables used in the graph previously discussed.Which variable is the dependent variable and which one is the independent variable?What deductions do you make about the type of variable and the axis it is placed on? <p>2. Identify the dependent and the independent variables in the following examples:</p> <ol style="list-style-type: none">During the day the height of the shade of a tree changes.The amounts of coffee in a cup as you drink it.The speed of a car as Dad drives from home to school.The petrol consumption during a trip.The volume of rice in a pot as Mum cooks it. <p>Activity 2</p> <p>Discuss the following with learners.</p> <ul style="list-style-type: none">a straight line shows a constant increase or decreasea curved line shows a change in the rate of increase or decreasea horizontal line shows that there are no change in terms of the variable on the y-axis.points without lines connecting them show that the data is discrete.the independent variable is plotted on the x-axisthe dependent variable is plotted on the y-axis.	<p>take part in discussion and answer questions</p> <p>answer questions asked and make deductions</p>



Activity 3

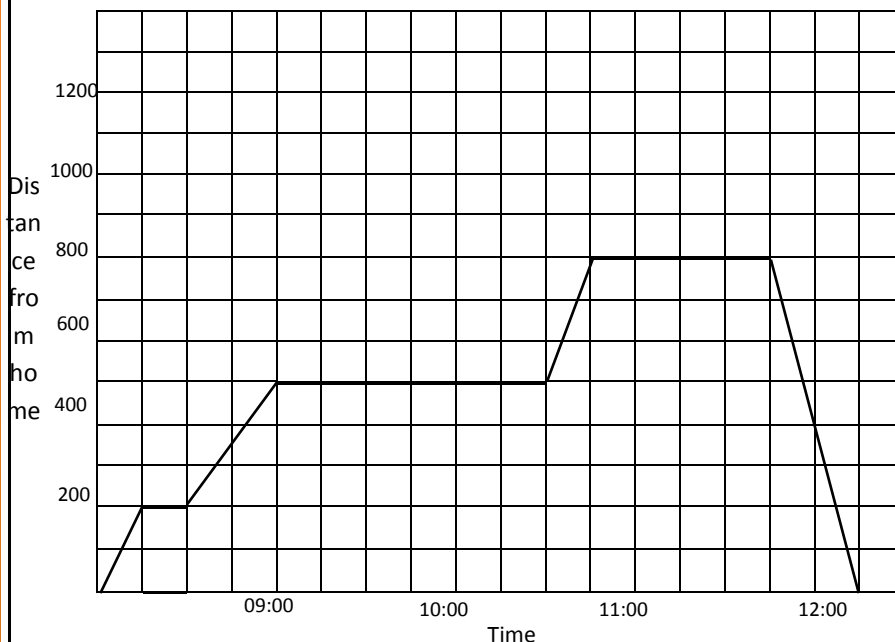
Demonstrate to learners how to draw the graph of the following situation.

Joseph left home at 08:00 the morning to visit his friend. He walked for 15 minutes to the nearest tuck shop which is 200m from his house to buy a drink. When he got there the lines were long and he waited 15 minutes to be served. He continued his walk of 300m and it took him 30 minutes to reach his friend's house. They watched a movie for 1 hour 30 minutes after which they got bored and decided to go to the swimming pool which is 300m away from his friend's house. It took them 15 minutes to get there. They spent 1 hour there with other friends. Joseph left for his house from the swimming pool and arrived at home 30 minutes later.

Solution:

The two variables are time and distance from home.

Time is the independent variable and distance from home is the dependent variable. Time must be plotted on the x -axis and the distance from home must be plotted on the y -axis.



follow the demonstration and engage in questioning

8. CLASSWORK (Suggested time: 15 minutes)

Sasol-Inzalo pg. 170 no 2

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

w) **Emphasise that:**

- a straight line shows a constant increase or decrease
- a curved line shows a change in the rate of increase or decrease
- a horizontal line shows that there are no change in terms of the variable on the y-axis.
- points without lines connecting them shows that the data is discrete.
- the independent variable is plotted on the x-axis
- the dependent variable is plotted on the y-axis.

Homework:

- a) Let learners write their own description of a situation that displays a relationship between time lapse and distance from home and back.
- b) Use the information in their description to draw a graph that will represent the situation.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GRAPHS: DRAWING GRAPHS (Lesson 6)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to use tables of ordered pairs to plot points and draw graphs on the Cartesian plane



3. RESOURCES:	DBE Workbook, Sasol-Inzalo Workbook, Textbooks, grid paper
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> features of graphs i.e. non-linear, constant, increasing, decreasing, maximum or minimum, discrete or continuous
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Play a game of "Finding my way" with learners to introduce the coordinate system.</p> <p>Give the learners the following activity to do: Look at the diagram. Help the bees find the flower. Give a clear description of how the bees will have to move to get to the flower</p> <p>NB: The bee can only move horizontally and vertically but not diagonally</p> <p>horizontal → vertical ↓ diagonal ↗</p>	

Discussion:

From this it is clear that two reference points are needed in order to give the bees direction. The bees either move vertically up or down or horizontally left or right.

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to:)
<p>ACTIVITY 1</p> <p>a) Tell learners how Rene Descartes discovered the Cartesian plane.</p> <p>René Descartes was a French man who lived in the 1600s. When he was a child, he was often sick, so the teachers at his boarding school let him to lie in bed until the afternoon. One day Descartes noticed a fly crawling around on the ceiling. He watched the fly for a long time. He wanted to know how to tell someone else where the fly was. Finally he realized that he could describe the position of the fly by its distance from the walls of the room. When he got out of bed, Descartes wrote down what he had discovered. Then he tried describing the positions of points, the same way he described the position of the fly. He then invented the coordinate system named after him, the Cartesian plane.</p>	<p>Listen to the story and make connection of how it fits in their lesson</p>

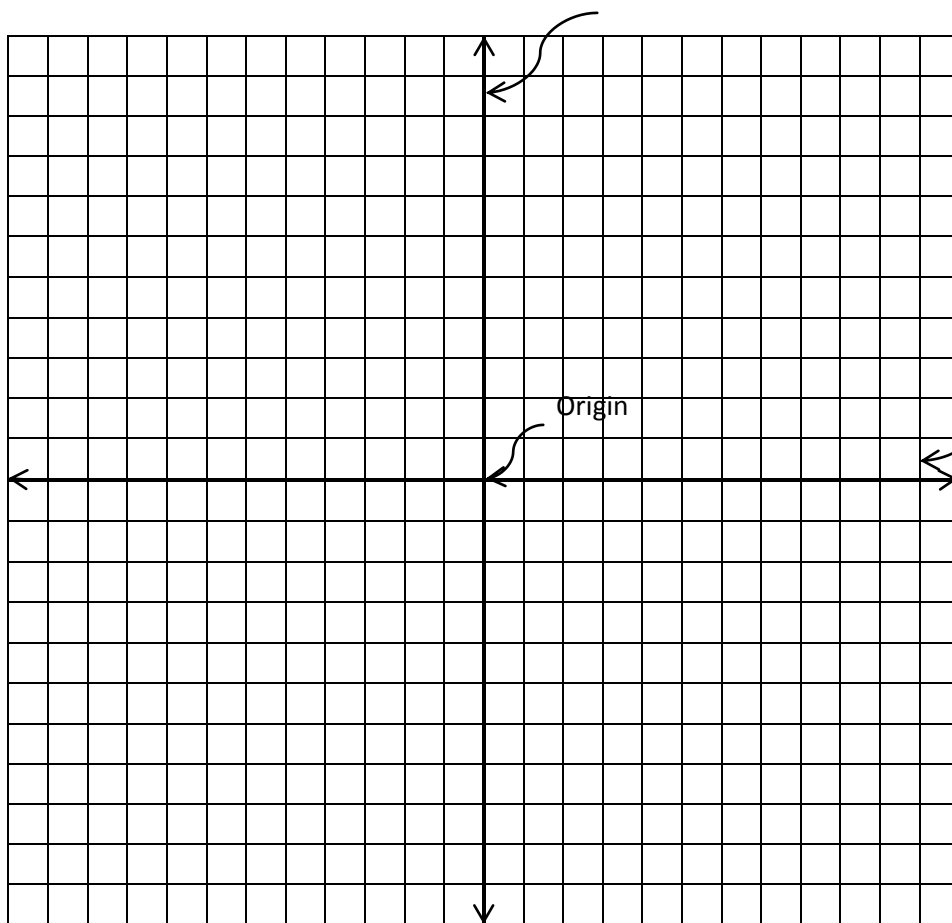


b) Discuss the features of a Cartesian plane with learners.

Note: Have it sketched on the board or make a flip chart with a Cartesian plane on it.

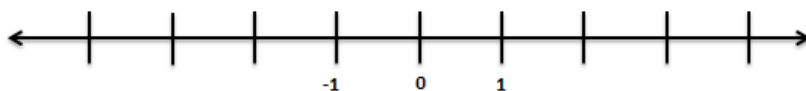
Vertical axis / y -axis

Follow the discussion of the teacher and engage in questions



Discussion:

- The Cartesian plane is formed by a pair of perpendicular number lines.
- On a number line positive integers appear on the right of zero and negative integers on the left of zero, i.e.



- The two lines intersect at the point where both the number lines are 0.
- This intersection point is called the Origin.
- The number lines are both marked with the set of integers. (Insert the numbers as it is explained).
- Each of the two number lines is called an axis.
- The horizontal axis, the one that goes across from side to side, is called the x -axis.

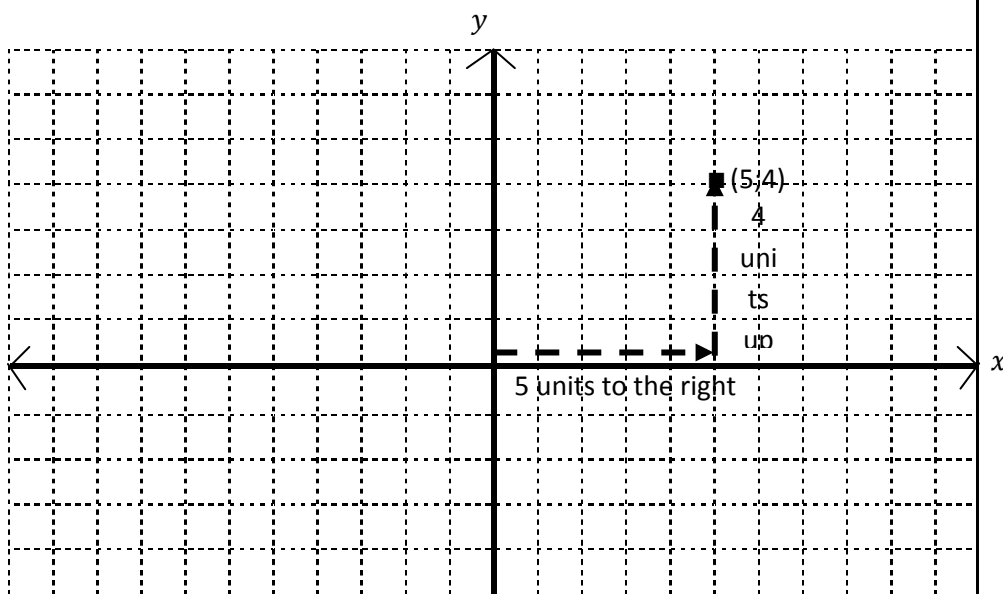
- The vertical axis, the one that goes up and down, is called the y -axis.

Activity 2

Demonstrate to learners how to plot a point on a Cartesian plane.

- Points can be drawn, or plotted, on the coordinate graph using specific coordinates.
- These coordinates are written using an ordered pair of numbers.
- These numbers are written inside parentheses and are separated by a comma, e.g. (5;4).
- A point is always plotted from the starting point of the origin, where the lines intersect through the number zero.
- The first number in the ordered pair shows how far left or right to move from zero on the x axis.
- The second number in the ordered pair shows how far up or down to move from zero on the y axis.

Follow demonstration and engage in discussion

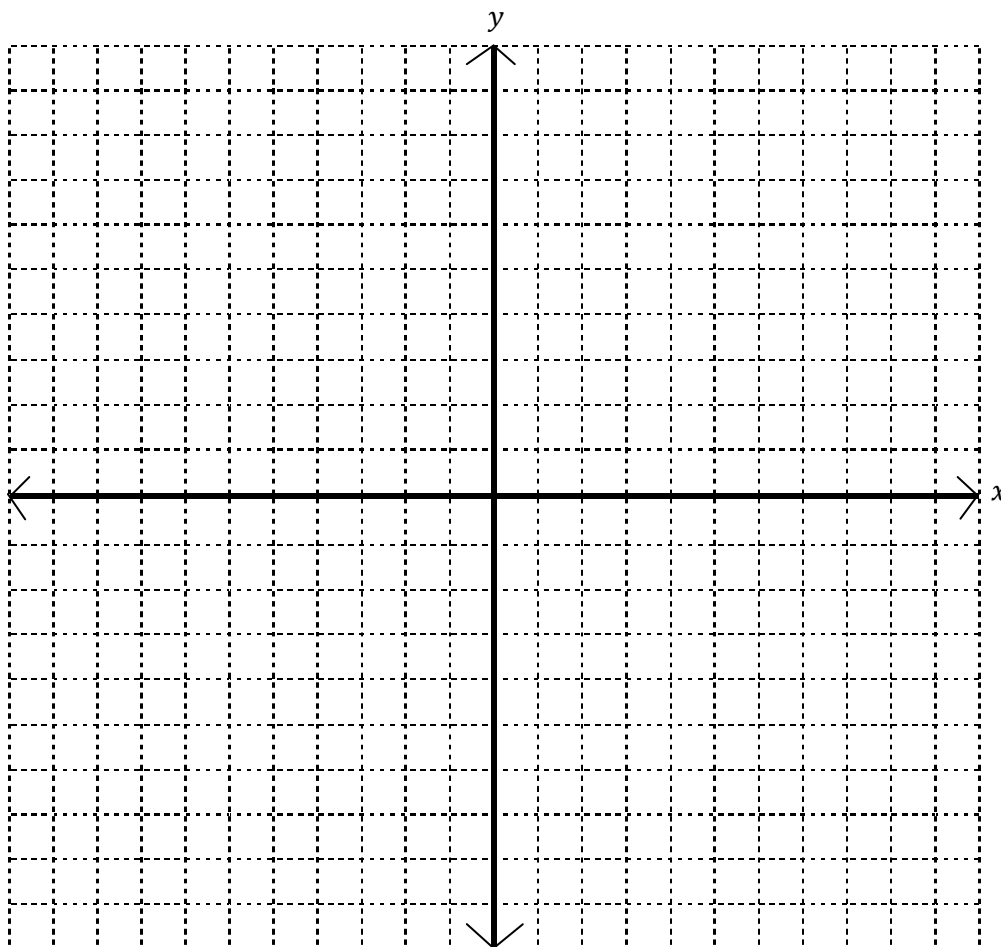


8. CLASSWORK (Suggested time: 15 minutes)

Activity

Use the Cartesian plane given to you and plot the given points. A surprise is waiting for you!

A (0;9), B (-6;4), C (-4;4), D (-8;0), E (-4;0), F (-10;-2), G (-4;2), H (-4;-6), I (4;-6), J (4;-2), K (10;-2), L (4;0), M (8;0), N (4;4), O (6;4), P (-5;-5), Q (-7;-5), R (-7;-7), S (-5;-7)



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

x) **Emphasise that:**

- the Cartesian plane is system where all points can be described by x - and y -coordinates.
- the horizontal number line represents the x -axis
- the vertical number line represents the y -axis
- the x -coordinate is the position along the x -axis
- the y -coordinate is the position along the y -axis
- the origin is the point where the horizontal and vertical axes meet
- an ordered pair is given in the form $(x; y)$

- y) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GRAPHS: DRAWING GRAPHS (Lesson 7)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to use tables of ordered pairs to plot points and draw graphs on the Cartesian plane



3. RESOURCES:	DBE Workbook, Sasol-Inzalo Workbook, textbooks, grid paper
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • substitution • Cartesian plane • features of graphs i.e. linear, non-linear, discrete, continuous
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Revise the Cartesian plane with learners by asking the following questions:</p> <ol style="list-style-type: none"> 1. What is the coordinate graphing system we use to sketch graphs called? 2. What kind of lines forms a coordinate graphing system? 3. What is the horizontal line called? 4. What is the vertical line called? 5. What do we call the point where the two axes meet? 6. What is the coordinates at this point mention in 5? 7. What do we call the numbers that gives us the direction on a Cartesian plane? 8. How do you know whether to move left or right from zero on the x-axis? 9. Explain what is meant by $(-2:5)$ 	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)																	
Teaching activities	Learning activities (Learners are expected to:)																
<p>Do the following activities with learners.</p> <p>Activity 1</p> <p>a) Complete the table of ordered pairs for the equation $y = 2x - 4$.</p> <table><tr><td>x</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>b) Plot the points on the Cartesian plane.</p> <p>c) What do you observe from the distribution of the points? Are they linear or non-linear?</p> <p>d) Can these points be joined by a line? Explain.</p>	x	-3	-2	-1	0	1	2	3	y								<ul style="list-style-type: none">• complete the table and plot the graph• discuss their observations
x	-3	-2	-1	0	1	2	3										
y																	

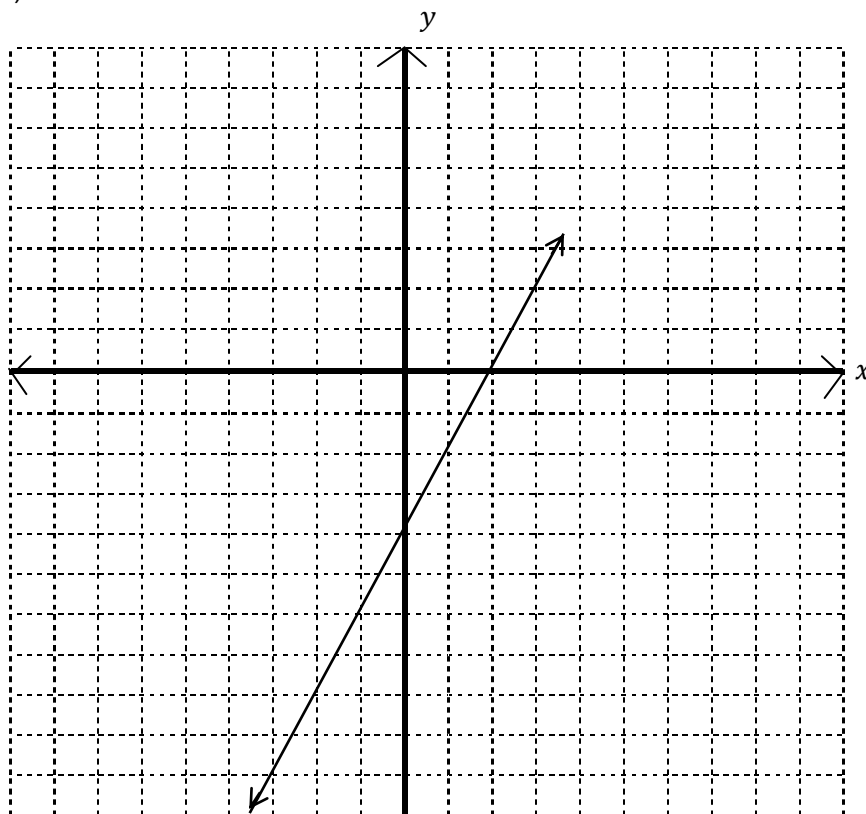


Solution:

a)

x	-3	-2	-1	0	1	2	3
y	-10	-8	-6	-4	-2	0	2

b)



c) The points lie in straight line.

d) Yes, they can be joined with a line because this equation holds true for all values in between.

8. CLASSWORK (Suggested time: 15 minutes)

Sasol-Inzalo pg. 172, no 2



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

a) **Emphasise that:**

- substitute the given x –value in the equation to determine the y -value.
- the values in a table form an ordered pair.
- the x -value giving the corresponding y -value when substituted in the equation forms the ordered pair

Homework:

Sasol-Inzalo pg. 173, no 4



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GRAPHS: DRAWING GRAPHS (Lesson 8)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to use tables of ordered pairs to plot points and draw graphs on the Cartesian plane



3. RESOURCES:	DBE Workbook, Sasol-Inzalo Workbook, textbooks, grid paper
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • substitution • Cartesian plane • features of graphs i.e. linear, non-linear, discrete, continuous
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Do the following activity with the learners:</p> <p>Activity</p> <p>Calculate the following:</p> <ol style="list-style-type: none"> 2^2 -2^2 $(-2)^2$ What is different about the three problems? 	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)																	
Teaching activities	Learning activities (Learners are expected to:)																
<p>Let learners do the following activity:</p> <p>Activity 1</p> <p>a) Complete the following table using the equation $y = x^2$</p> <table><tr><td>x</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>b) Plot the points on a Cartesian plane.</p> <p>c) What do you observe from the distribution of the points? Are they linear or non-linear?</p> <p>d) Can these points be joined? Explain and prove your explanation.</p> <p>e) Join the points.</p>	x	-3	-2	-1	0	1	2	3	y								<p>complete activity and engage in discussion</p>
x	-3	-2	-1	0	1	2	3										
y																	

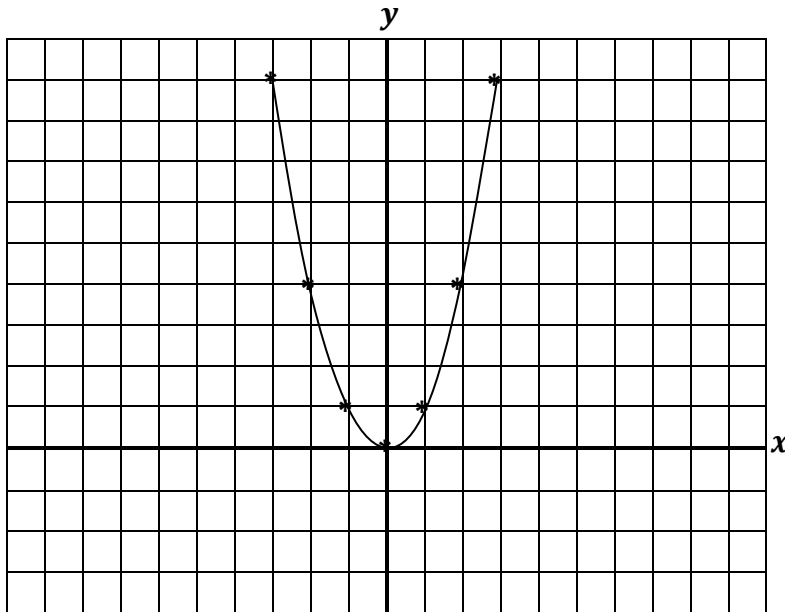


Solution:

a)

x	-3	-2	-1	0	1	2	3
y	9	4	1	0	1	4	9

b)



c) The points are non-linear.

d) Yes the data is continuous because the equation is true for all values in between the ones given. $y = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

8. CLASSWORK (Suggested time: 15 minutes)

Sasol-Inzalo pg. 173, no 3

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

z) **Emphasise that:**

- when squaring a negative number it must be placed in brackets.
- when the degree of the equation is more than one it does not give a linear graph.

Homework:

Sasol-Inzalo pg. 174, no 5



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – November 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
	1 Hour

1. TOPIC: TRANSFORMATION GEOMETRY: TRANSFORMATIONS (Lesson 1)

2. CONCEPTS & SKILLS TO BE ACHIEVED

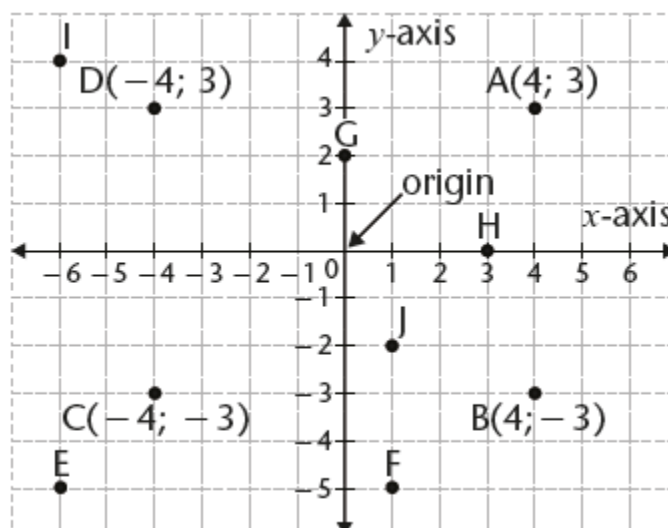
By the end of the lesson learners should know and be able to recognise, describe and perform transformations with points on a coordinate plane, focusing on:

- reflecting a point in the Y-axis or X-axis
- translating a point within and across quadrants



3. RESOURCES:	Sasol-Inzalo workbook, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> plotting points on the Cartesian plane translating points reflecting points
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (suggested time: 10 Minutes)	

Note: allow learners to work in pairs. Give each pair a grid paper to work on. Assist learners as they work through the activity. The position of any point on a system of coordinates can be described by two numbers, as demonstrated below for the points A, B, C and D.



The horizontal axis on the coordinate system is called the x-axis and the vertical axis is called the y-axis. The ordered pair (4; 3) indicates that the value of the x-coordinate is 4 and the value of the y-coordinate is 3. A coordinate system is divided into four sections called quadrants.

1. What are the coordinates of each of E, F, G, H, I, J on the above grid?

Solution: E (-6; -5); F (1; -5); G (0; 2); H (3; 0); I (-6; 4); J (1; -2)

2. Consider the following diagram, which shows point A (-2; 4) plotted in a Cartesian plane. Each block represents one square unit.

(a) Plot each of the following points in the Cartesian plane provided above

B (0; 4)

C (0; 3)

D (3; 3)

E (3; 1)

F (9; 1)

G (7; -2)

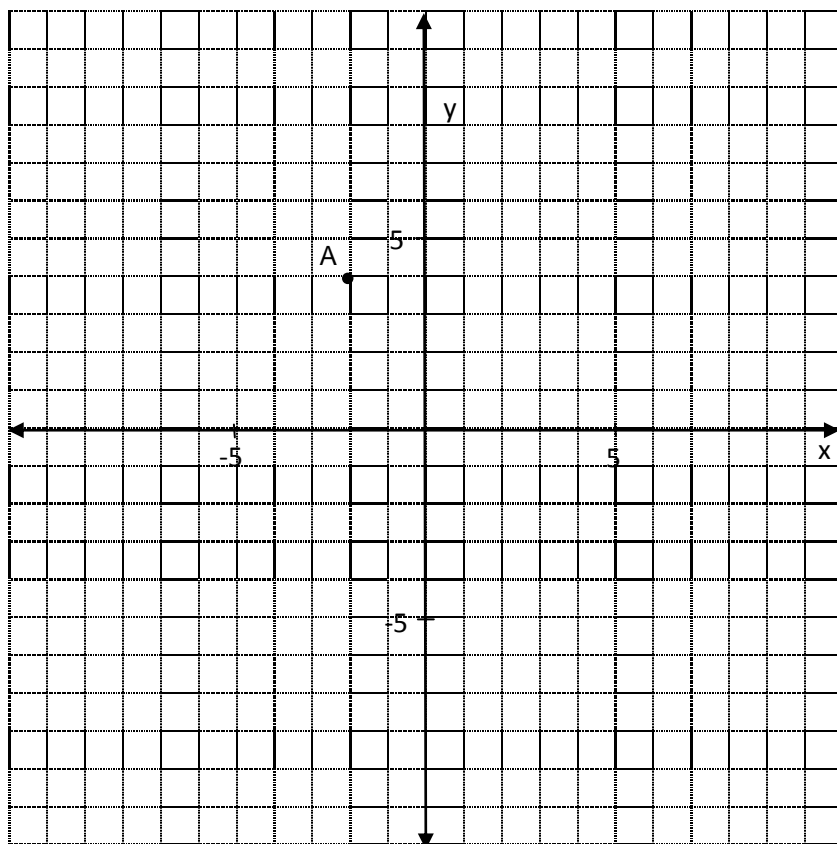
H (-8; -2)

I (-10; 1)

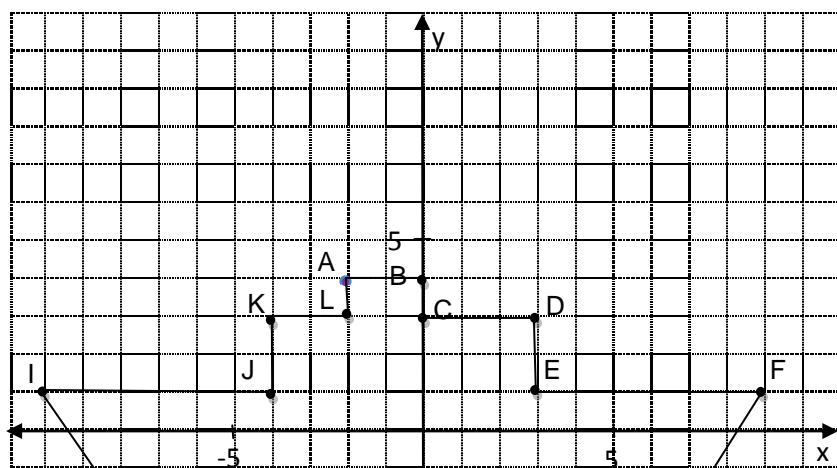
J (-4; 1)

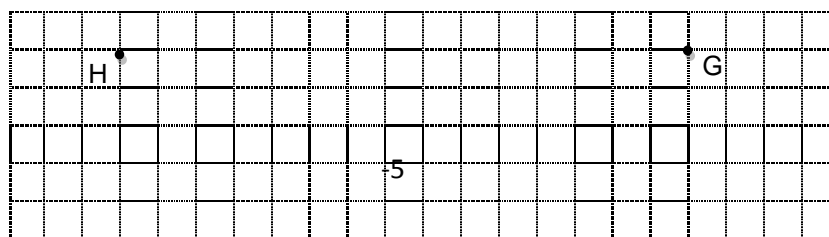
K (-4; 3)

L (-2; 3)



Solution:



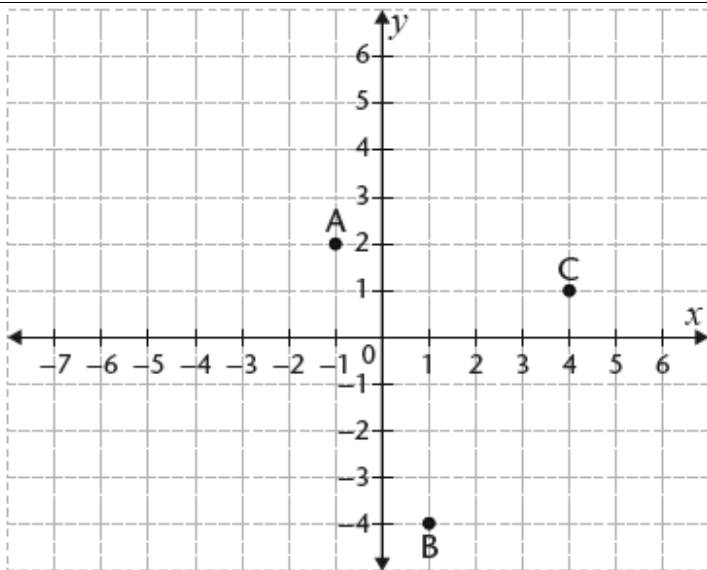


- b) Label each point with the correct letter, as has been done with point A.
- c) Draw a straight line from point A to point B, then another straight line from point B to point C, and then another from point C to point D, and so on. Finally, draw a straight line from point L to point A.
- d) Shade the figure you have created to make it more prominent in the diagram. Compare your completed diagram with your neighbour's, and discuss any differences.

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to :)
<p>Note: To name the image, we use the same letters as in the original figure, but we add the prime symbol (') after each letter. For example, the image of $\triangle ABC$ is $\triangle A'B'C'$. If there is a second image, we add two prime symbols, for example $\triangle A''B''C''$. If there is a third image, we use three prime symbols, for example $\triangle A'''B'''C'''$, and so on.</p> <ol style="list-style-type: none"> Allow the learners to work in pairs doing the following: <ol style="list-style-type: none"> a) Slide your book on the desk from one position to the other. b) Has the size and shape of the book changed? c) What mathematical word do we use for sliding objects? Use the diagram below to answer questions that follow: 	<ul style="list-style-type: none"> work in pairs on the problems given. copy down examples onto their exercise books.





(a) Write down the coordinates of points A, B and C.

Solution: A(-1; 2); B(1; -4); C(4; 1)

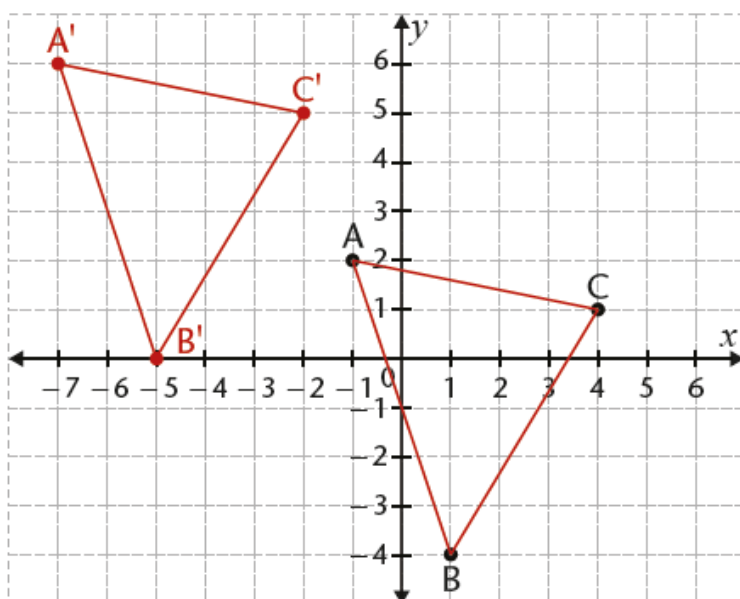
(b) Translate A, B and C 6 units to the left and 4 units up.

(c) Write down the coordinates of points A', B' and C'.

Solution: A'(-7; 6); B' (-5; 0); C' (-2; 5)

(d) Join points A, B and C to form a triangle. Do the same with points A', B' and C'.

Solution

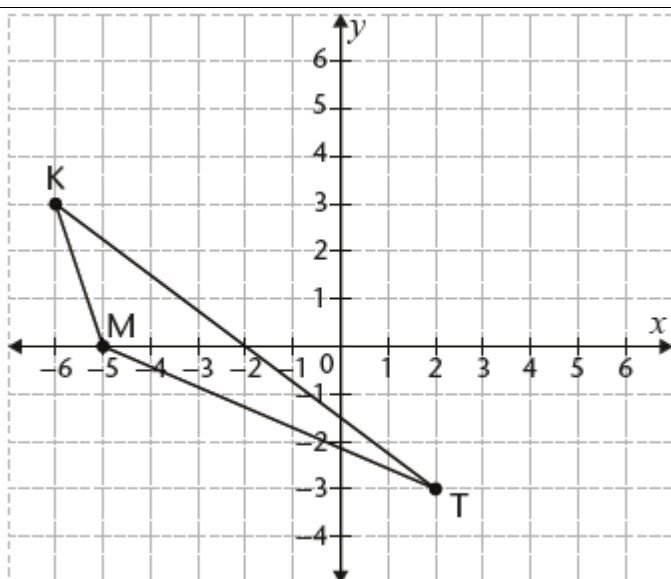


(e) Are $\triangle ABC$ and $\triangle A'B'C'$ congruent? Explain.

Solution: Yes, because their corresponding angles are equal and the size of an object and an image is the same.

Note: apply a real life context to enforce reflection on the learners e.g. looking at oneself in the mirror. A flip-over is also called a **reflection**.





The points K, M and T are plotted on the coordinate system as shown above.

- (a) Write down the coordinates of points K, M and T.

Solution: $K(-6; 3)$; $M(-5; 0)$; $T(2; -3)$

- (b) Reflect each point in the x-axis and write down the coordinates of K' , M' and T' .

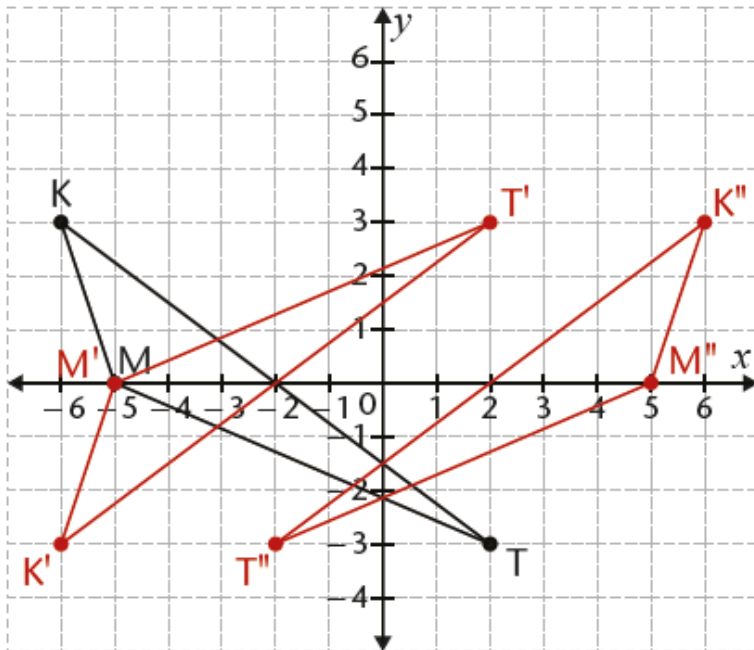
Solution: $K'(-6; -3)$; $M'(-5; 0)$; $T'(2; 3)$

- (c) Reflect points K, M and T in the y-axis and write down the coordinates of K'' , M'' and T'' .

Solution: $K''(6; 3)$; $M''(5; 0)$; $T''(-2; -3)$

- (d) Join points K, M and T to form a triangle. Do the same with points K' , M' and T' , and with points K'' , M'' and T'' .

Solution:



e) Are all three triangles congruent?

Solution: Yes

8. CLASSWORK (Suggested time: 15 minutes)

1. Draw points A (1; 1), B (1;-3) and C (7;-3) on the Cartesian plane and join the them.
2. Translate each point 11 units to the right and 9 units up. Label the points A' , B' and C' and join them.
3. Reflect point A, B and C in the y-axis
4. Colour in your three different triangles using different colours.

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)



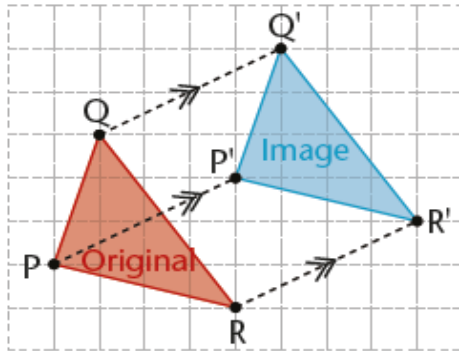
a) Emphasise that:

- drawings should be done in pencil.

In translation:

- the line segments that connect any point in the original figure to its image are all equal in length.

In the diagram: $PP' = RR' = QQ'$



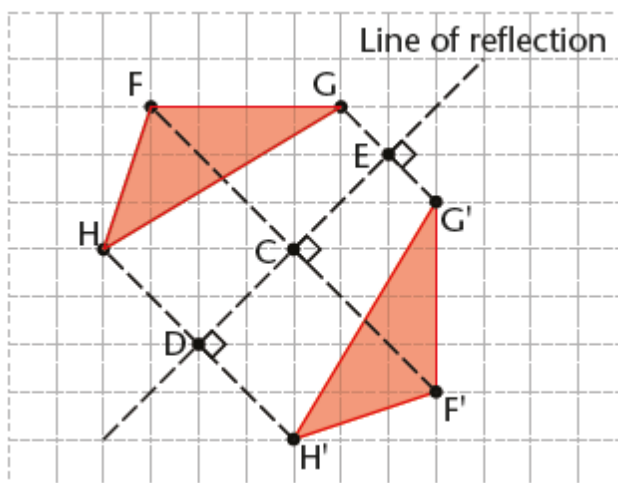
- the line segments that connect any original point in the figure to its image are all parallel.

In the diagram: $PP' \parallel RR' \parallel QQ'$

- when a figure is translated, its shape and size do not change. The original and its image are **congruent**.

In reflection:

- the image of $\triangle FGH$ lies on the opposite side of the **line of reflection** (mirror line). – see sketch below
- the distance from the original point to the line of reflection is the same as the distance from the image point to the line of reflection.



In the diagram: $GE = G'E$; $FC = F'C$ and $HD = H'D$.

- the line that connects the original point to its image point is always perpendicular (\perp) to the line of reflection.

In the diagram: $HH' \perp$ line of reflection, $FF' \perp$ line of reflection and $GG' \perp$ line of reflection.

- when a figure is reflected, the figure and its image are **congruent**.
- when you translate or reflect a triangle, first translate or reflect the vertices of the triangle and then join the translated or the reflected points.

b) Homework

The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Select activities from Sasol-Inzalo Book 2 on page 180 to 182.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 3: July – September 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: TRANSFORMATION GEOMETRY: TRANSFORMATIONS (Lesson 2)

2. CONCEPTS & SKILLS TO BE ACHIEVED

By the end of the lesson learners should know and be able to recognise, describe and perform transformations with triangles on a co-ordinate plane, focusing on the co-ordinates of the vertices when reflecting a triangle in the X-axis or Y-axis



3. RESOURCES:	Textbooks, DBE Workbook, Sasol-Inzalo Workbook, paper.
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> plotting points on the Cartesian plane translating points reflecting points the relationship between the image and the object in terms of size and shape.
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION (Suggested time: 10 Minutes) Note: verbally instruct the learners to do the following activity using the following instructions. Instructions: <ul style="list-style-type: none"> Take an A4 paper and label the corners in a clockwise direction starting from the top left. Fold the paper in such a way that A lies on top of D and B on top of C. Questions <ol style="list-style-type: none"> What do you observe? Solution: The two halves are the same size What divides the paper into two-halves? Solution: The fold What do we call an "object" that allows a person to see his image? Solution: Mirror In this case, what would you say serve as that "object"? Solution: The fold (line) Note: explain to the learners that the line or fold serves as the mirror line because the "flip" gives two equal papers where one is the mirror image of the other. The shape formed after the "flip" is called the image and the other one is called the object. We refer to this flip in mathematics as reflection.	
7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)	

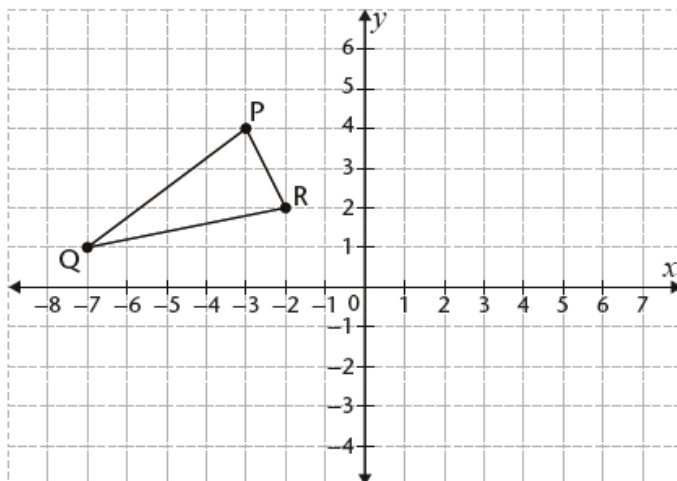


Teaching activities

Note: in grade 8, learners reflect in the x-axis and the y-axis only. Explain that reflecting in the x-axis means the x-axis is the **mirror line** and similarly with the y-axis. In the previous lesson, learners have reflected points and then joined points to form triangles. The same method can be used in the examples below. Do the first example with them and then allow them to do the second one on their own.

1. Reflect the triangle below on the same set of axes:

- a) $\triangle PQR$ in the x-axis.
- b) $\triangle PQR$ in the y-axis.



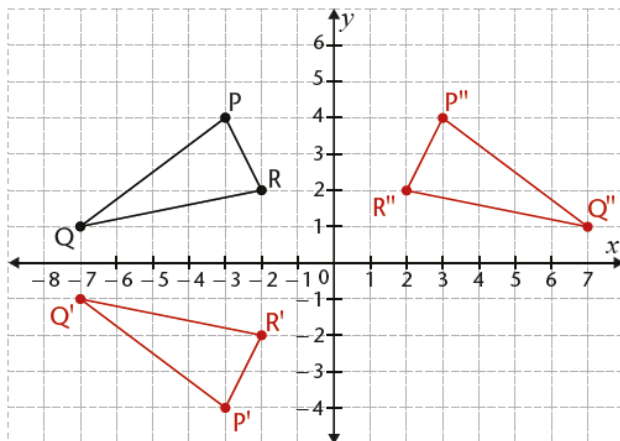
Note: remind the learners to use “prime” on the images as explained in the previous lesson.

Learning activities

(Learners are expected to:)

- respond to questions asked by the teacher in number 1.
- work in pairs doing number 2.
- copy down the example onto their exercise books.

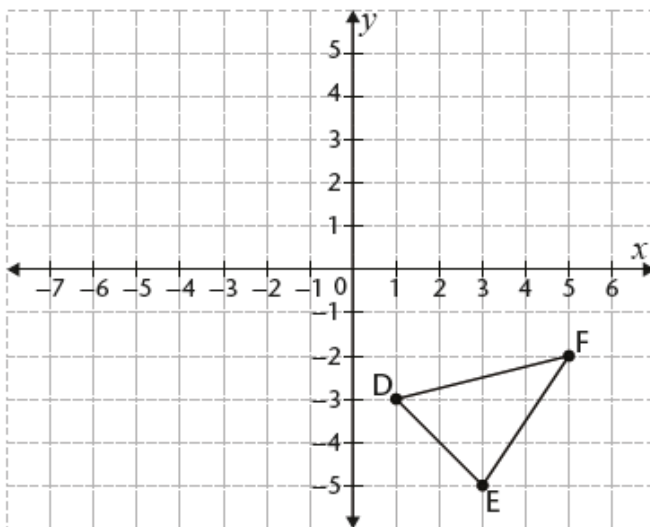
Solution



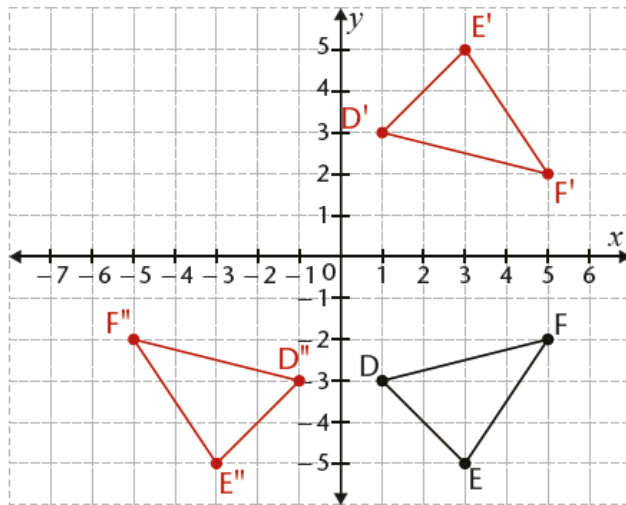
2. Reflect the triangle below on the same set of axes:

a) $\triangle DEF$ in the x-axis.

b) $\triangle DEF$ in the y-axis.



Solution



3. a) Investigate the relationship between the coordinates of the object and the coordinates of the image. What do you conclude, present your answer in writing.

Solution: the x-coordinates of an object remain the same after reflection and the sign of the y-coordinate changes.

Note: Guide the learners to use the results of their investigation to answer questions on the classwork below.

8. CLASSWORK (Suggested time: 15 minutes)

Complete the following tables:

1.

Vertices of triangle	Reflection in the x - axis
L (-4; 5)	
M (2; -5)	
N (-5; -3)	

2.

Vertices of triangle	Reflection in the y - axis
P (-1;3)	
Q (-2; -3)	
R (4; 1)	

3.

Vertices of triangle	Reflection in the x - axis	Reflection in the y - axis
S (-2; 5)		
T (0; -3)		
U (2; 0)		

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

c) **Emphasise that:**

- drawings should be done in pencil.
- the image of $\triangle FGH$ lies on the opposite side of the **line of reflection** (mirror line). – see sketch below
- the distance from the original point to the line of reflection is the same as the distance from the image point to the line of reflection.
- the line that connects the original point to its image point is always perpendicular (\perp) to the line of reflection.



- when a figure is reflected, the figure and its image are **congruent**.
- when you translate or reflect a triangle, first translate or reflect the vertices of the triangle and then join the translated or the reflected points.

d) Homework

The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Select activities from Sasol-Inzalo Book 2 on page 180 to 182 and DBE workbook 2 on page 154 to 155.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – November 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
	1 Hour

1. TOPIC: TRANSFORMATION GEOMETRY: TRANSFORMATIONS (Lesson 3)

2. CONCEPTS & SKILLS TO BE ACHIEVED

By the end of the lesson learners should know and be able to recognise, describe and perform transformations with triangles on a co-ordinate plane, focusing on the co-ordinates of the vertices when translating a triangle within and across quadrants.

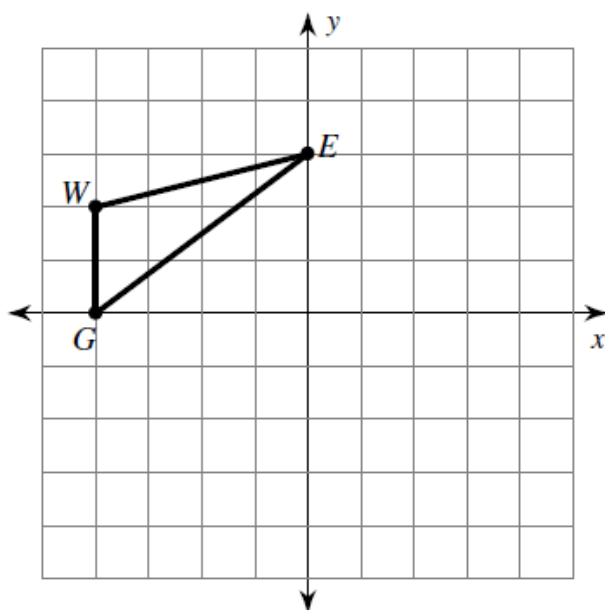


3. RESOURCES:	DBE workbook, Sasol-Inzalo workbook, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> plotting points on the Cartesian plane translating points reflecting points the relationship between the image and the object in terms of size and shape.
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION (Suggested time: 10 minutes)	

Note: present the following activity to the learners step by step informed by the translation of points which they did in lesson 1. When you translate you translate to the left or to the right, you translate horizontally and when you translate up or down, you translate vertically.

Translate the triangle below:

- (a) 1 unit up and 2 units down
- (b) 3 units right 4 units down



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

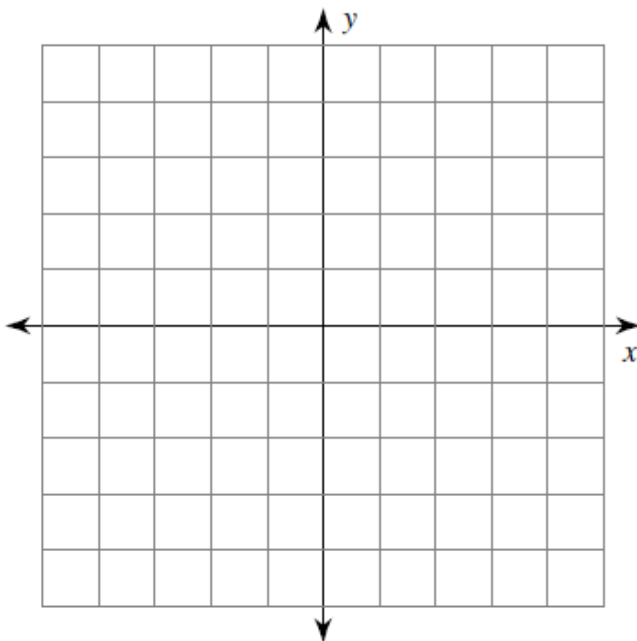
Teaching activities	Learning activities (Learners are expected to :)
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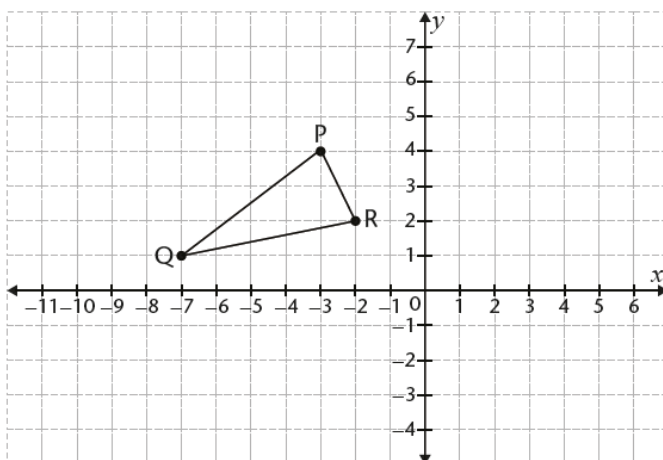
Note: present the following activities to the learners. In lesson one, learners translated points and then joined points to form triangles. The same method can be used in the examples below.

1. Use the grid below to translate a triangle with vertices : Z (-4; -3); O (-2; -2) and E (-2; -4)

5 units up and 2 units to the right.



Use the diagram below to answer the following questions.



(a) Translate $\triangle PQR$ 6 units to the right and 2 units down. What are the

- Respond to questions asked by the teacher.
- Copy down the examples onto their exercise books.

coordinates of the vertices of $\Delta P'Q'R'$?

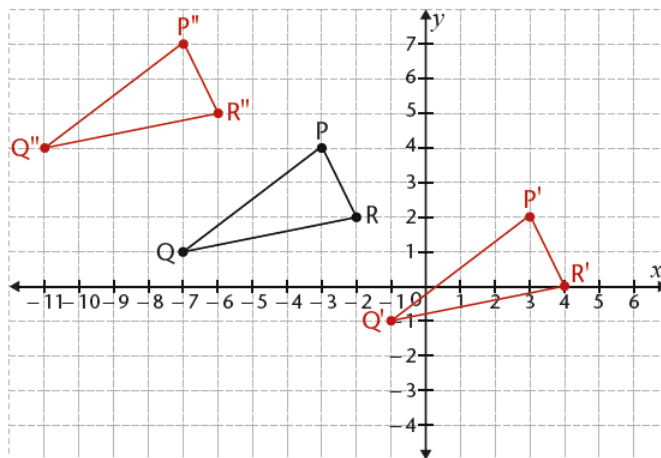
Solution: $P'(3; 2)$; $Q'(-1; -1)$; $R'(4; 0)$

(b)(i) Translate ΔPQR 4 units to the left and 3 units up.

(ii) What are the coordinates of the vertices of $\Delta P''Q''R''$?

Solution: $P''(-7; 7)$; $Q''(-11; 4)$; $R''(-6; 5)$

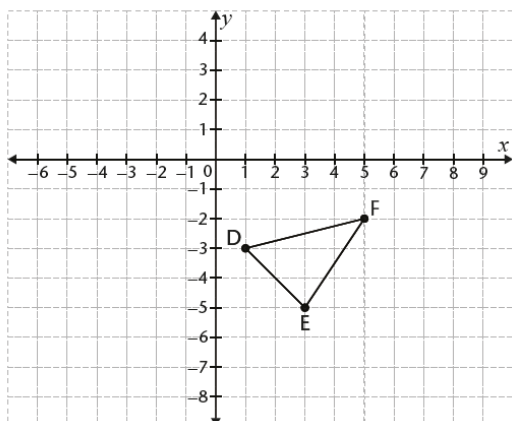
Solution (translation from above)



8. CLASSWORK (Suggested time: 15 minutes)



1. Use the diagram below to answer the following question.



(a)(i) Translate $\triangle DEF$ 4 units to the left and 2 units down.

(ii) What are the coordinates of the vertices of $\triangle D'E'F'$?

(b)(i) Translate $\triangle DEF$ 3 units to the right and 4 units up.

(ii) What are the coordinates of the vertices of $\triangle D''E''F''$?

2. Complete the following table:

Vertices of triangle	Translated 5 units to the right and 2 down	Translated 4 units to the left and 3 down	Translated 2 units to the right and 3 up
Q (-1; 3)			
R (-2; -3)			
S (4; 0)			

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)



e) Emphasise that:

- drawings should be done in pencil.
- when a figure is translated, its shape and size do not change. The original and its image are **congruent**.
- when you translate you translate to the left or to the right, you translate horizontally and when you translate up or down, you translate vertically.

f) Homework

The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Select activities from Sasol-Inzalo Book 2 on page 181 and DBE workbook 2 158 to 161.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – November 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
	1 Hour

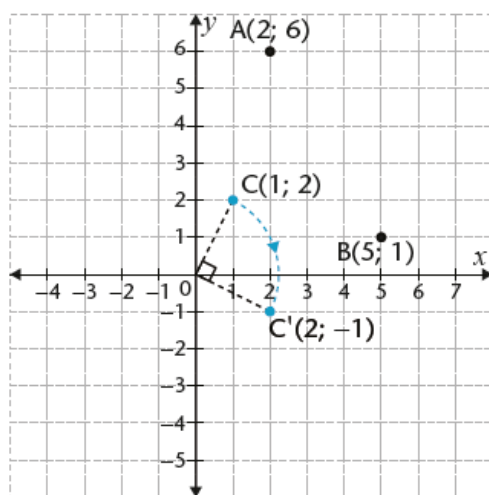
1. TOPIC: TRANSFORMATION GEOMETRY: TRANSFORMATIONS (Lesson 4)

2. CONCEPTS & SKILLS TO BE ACHIEVED

By the end of the lesson learners should know and be able to recognise, describe and perform transformations with triangles on a co-ordinate plane, focusing on the co-ordinates of the vertices when rotating a triangle around the origin.



3. RESOURCES:	DBE workbook, Sasol-Inzalo workbook, textbook, ruler, protractor
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> plotting points on the Cartesian plane translating points and points on a triangle reflecting points and points on a triangle the relationship between the image and the object in terms of size and shape.
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION (suggested time: 10 Minutes) Note: present the following activity to the learners. In the diagram, point C has been rotated 90° clockwise about the origin.	

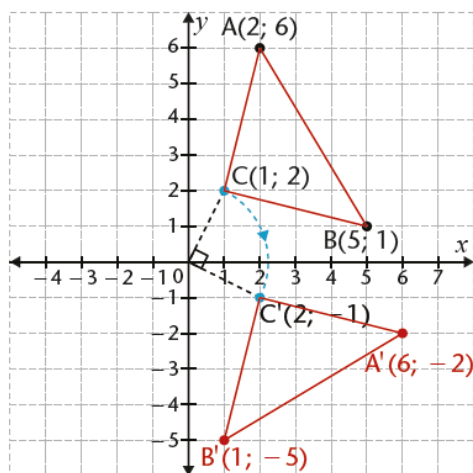


(a) Rotate points A and B 90° clockwise about the origin.

(b) Write down the coordinates of points A' and B'.

Solution: A' (6; -2) and B' (1; -5)

(c) Join points A, B and C to form a triangle. Do the same with points A', B' and C'.



(d) Is the triangle and its image congruent?

Solution: **Yes**

(e) Compare the coordinates of points A, B and C with the coordinates of their images. What do you notice?

Solution: The y -coordinate of the original point becomes the x -coordinate of its image, and the inverse of the x -coordinate of the original point becomes the y -coordinate of its image.

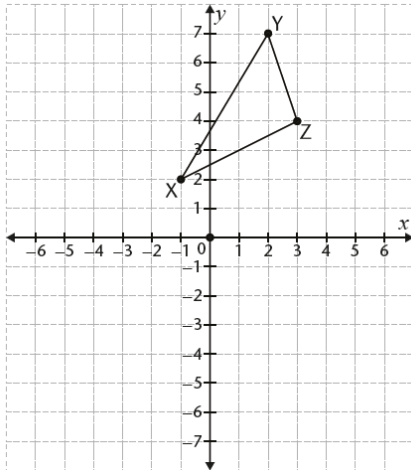
7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to :)
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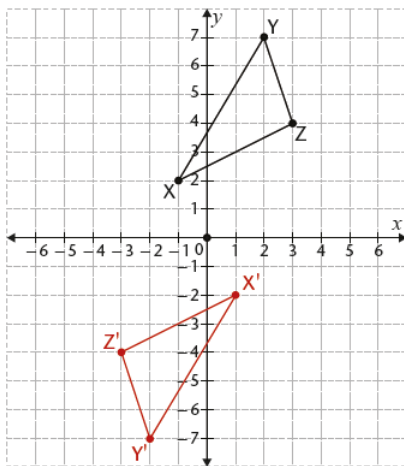
Note: present the following activities to the learners.

1. Rotate the following triangles and write down the coordinates of the vertices of each triangle after the required rotation (image).

(a) 180° about the origin



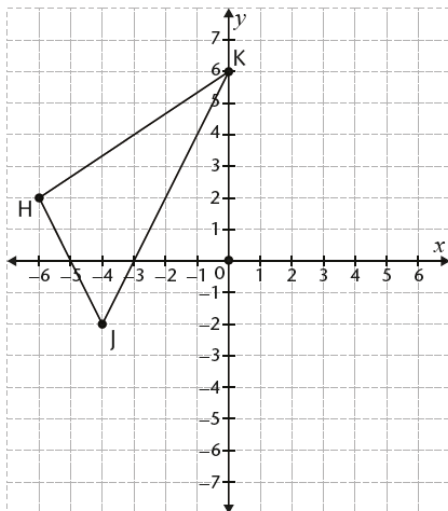
Solution



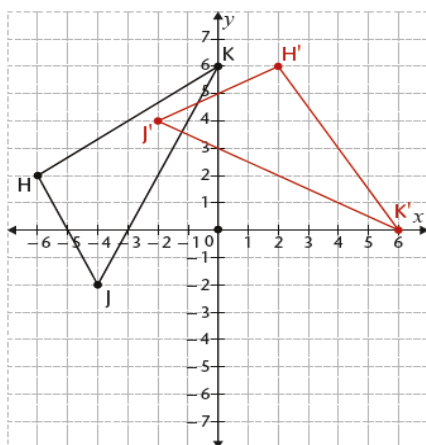
Solution: $X' (1; -2)$; $Y' (-2; -7)$; $Z' (-3; -4)$

- respond to questions asked by the teacher during the presentation
- copy down examples onto their exercise books

(b) 90° clockwise about the origin

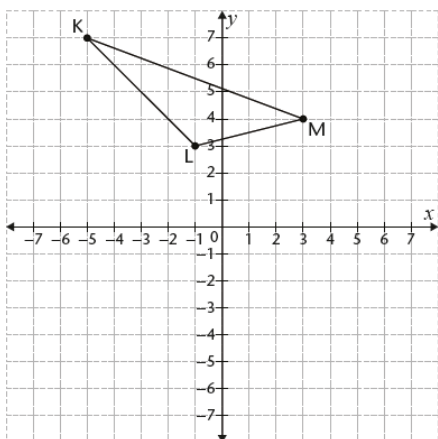


Solution



Solution: $H'(2; 6)$; $J'(-2; 4)$; $K'(6; 0)$

2. Use the diagram below to answer the questions that follow:



(a) Write down the coordinates of points K, L and M.

Solution: $K(-5; 7)$; $L(-1; 3)$; $M(3; 4)$

(b) Rotate points K, L and M 90° anticlockwise about the origin.

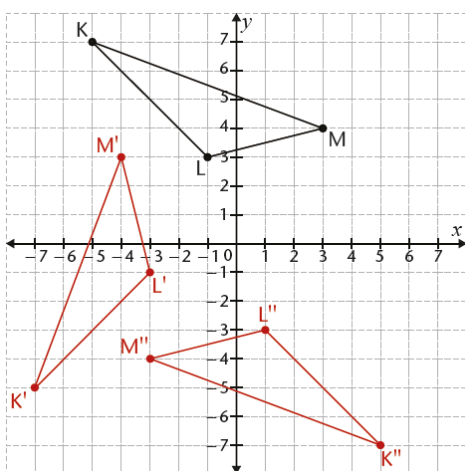
(c) Write down the coordinates of the image points.

Solution: $K'(-7; -5)$; $L'(-3; -1)$; $M'(-4; 3)$

(d) Rotate points K, L and M 180° about the origin.

(e) Write down the coordinates of K'' , L'' and M'' .

Solution: $K''(5; -7)$; $L''(1; -3)$; $M''(-3; -4)$



(f) Can you explain why there was no need to say “clockwise” or “anticlockwise” in question (d)?

Solution: A 180° angle is a straight line. Whether you rotate

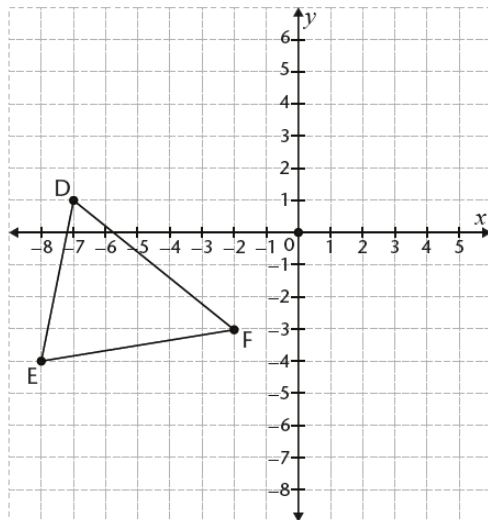
clockwise or anticlockwise about 180° , you will be in the same spot, i.e. directly opposite in a straight line from where you were.

8. CLASSWORK (Suggested time: 15 minutes)

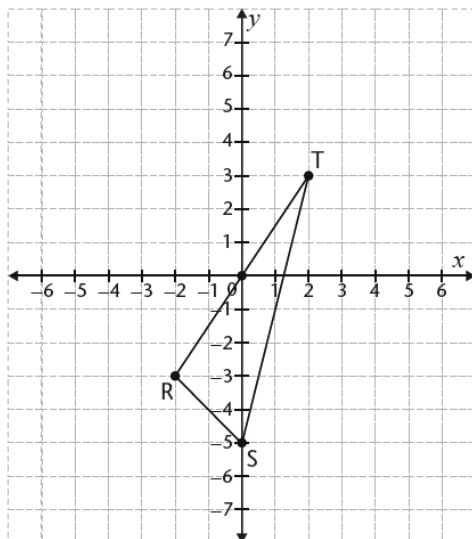


1. Rotate the following triangles and write down the coordinates of the vertices of each triangle after the required rotation.

(a) 90° anticlockwise about the origin



(b) 180° about the origin



2. Write down the coordinates of each image point after these transformations using the conclusion on rotated images and their objects drawn above.

(a) Rotation 180° about the origin: K(-1; 0); C(1; 1); N(3; -2)

(b) Rotation 90° clockwise about the origin: L(1; 3); Z(5; 5); F(4; 2)

(c) Rotation 90° anticlockwise about the origin: S(1; -4); W(1; 0); J(3; -4)

(d) Rotation 180° about the origin: V(-5; -3); A(-3; 1); G(0; -3)



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

g) Emphasise that:

- drawings should be done in pencil.
- when a figure is rotated, its shape and size do not change. The original and its image are **congruent**.
- when you rotate a triangle, first rotate the vertices of the triangle (the points) and then join the translated or the reflected points.

h) Homework

The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Select activities from Sasol-Inzalo Book 2 on page 180 to 182 and DBE workbook 2 on page 156 to 157.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – November 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
	1 Hour

1. TOPIC: TRANSFORMATION GEOMETRY: TRANSFORMATIONS (Lesson 5)

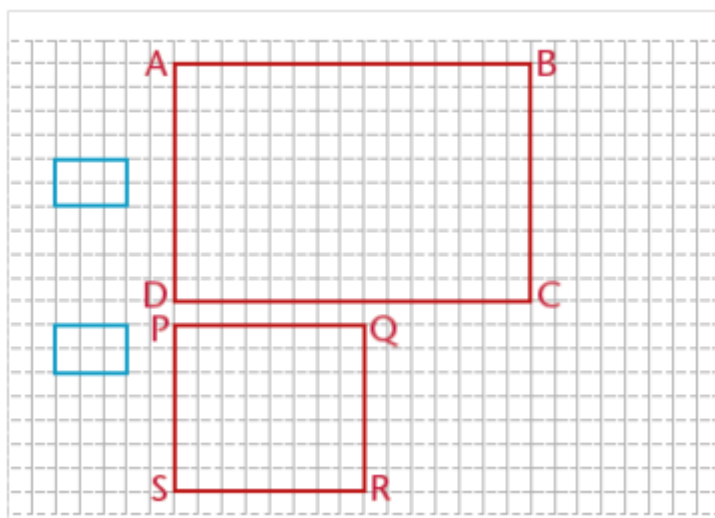
2. CONCEPTS & SKILLS TO BE ACHIEVED

By the end of the lesson learners should know and be able to use proportion to describe the effect of enlargement or reduction on area and perimeter of geometric figures.



3. RESOURCES:	DBE workbook, Sasol-Inzalo workbook, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • multiplication of a whole number by a whole number • multiplication of a whole number by a fraction
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore, it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION (suggested time: 10 Minutes)	

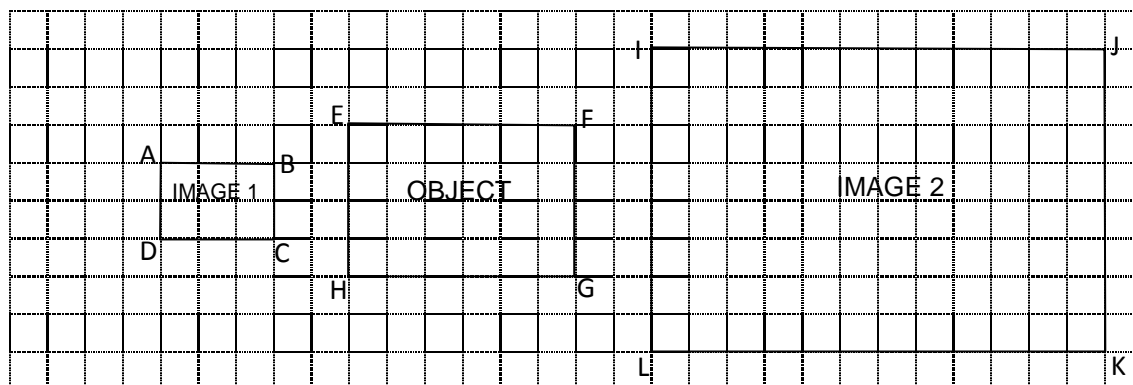
Note: A figure is only called an enlargement or reduction of another figure if the two figures have **the same shape**. The shapes can only be the same if all the corresponding angles are equal and corresponding sides are in proportion.



Instruction: Ask learners to state whether rectangle ABCD; rectangle PQRS or both rectangles are an enlargement of the smaller rectangle.

Note: To find the lengths of the sides of the new figure, the lengths of the sides of the original figure are all multiplied by the same number. This number (multiplier) is called the **scale factor** of the enlargement or reduction. The scale factor for an **enlargement** is bigger than 1. The scale factor for a **reduction** is smaller than 1. A figure is only called an

enlargement or reduction of another figure if the **corresponding angles are equal** and the **ratio between the lengths of the corresponding sides is the same**, for all pairs of corresponding angles and sides in the two figures. For example:



Calculate the following:

$$(a) \frac{BC}{FG} = \frac{2}{4} = 2:4 = \frac{1}{2}$$

$$\frac{JK}{FG} = \frac{8}{4} = 8:4 = 2$$

$$(b) \frac{AD}{EH} = \frac{2}{4} = 2:4 = \frac{1}{2}$$

$$\frac{IL}{EH} = \frac{8}{4} = 8:4 = 2$$

$$(c) \frac{AB}{EF} = \frac{3}{6} = 3:6 = \frac{1}{2}$$

$$\frac{IJ}{EF} = \frac{12}{6} = 12:6 = 2$$

$$(d) \frac{DC}{HG} = \frac{3}{6} = 3:6 = \frac{1}{2}$$

$$\frac{LK}{HG} = \frac{12}{6} = 12:6 = 2$$

Note: therefore, the **corresponding angles are equal** and the **ratio between the lengths of the corresponding sides is the same**, for all pairs of corresponding angles and sides in the two figures in each case. We therefore say that, the **scale factor** of a reduction from EFGH to ABCD is $\frac{1}{2}$ and the **scale factor** of the enlargement from EFGH to IJKL is 2.

Hint: when forming ratios, start with the dimensions of the **image** first.

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to :)
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Note: let learners work in pairs to answer the questions that follow:

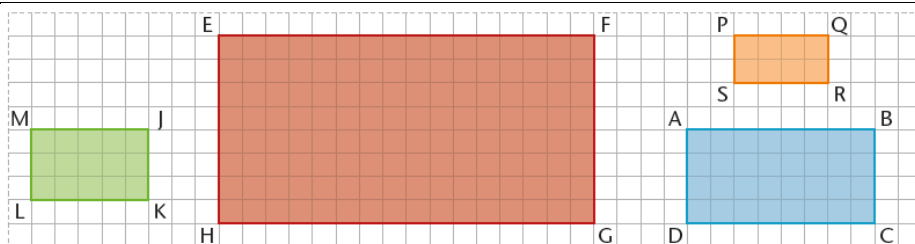
1. A rectangular shape on a photograph is 3 mm wide and 4 mm long. The photograph is enlarged with a scale factor of 5. What is the width and length of the rectangular shape on the enlarged photograph?

Solution: 15 mm wide and 20 mm long

Consider the rectangles below and answer the questions that follow:

- respond to questions asked by the teacher during the presentation.
- copy down the examples onto their exercise books.





2. (a) Do you think EFGH is an enlargement of MJKL?
 (b) Do you think PQRS is a reduction of EFGH?
 (c) Do you think EFGH is an enlargement of ABCD?

Learners should be allowed to test their hypotheses.

3. (a) Calculate $\frac{EF}{MJ}$, $\frac{FG}{JK}$, $\frac{GH}{KL}$ and $\frac{HE}{LM}$

$$\frac{EF}{MJ} = \frac{16}{5} = 3\frac{1}{5}, \frac{FG}{JK} = \frac{8}{3} = 2\frac{2}{3}, \frac{GH}{KL} = 3\frac{1}{5} \text{ and } \frac{HE}{LM} = 2\frac{2}{3}$$

- (b) Is rectangle EFGH an enlargement of rectangle MJKL?

Solution: No

- (c) If EFGH is an enlargement of MJKL, what is the scale factor?

Solution: Not an enlargement

4. (a) Calculate $\frac{PQ}{EF}$, $\frac{QR}{FG}$, $\frac{RS}{GH}$ and $\frac{SP}{HE}$

$$\frac{PQ}{EF} = \frac{4}{16} = \frac{1}{4}, \frac{QR}{FG} = \frac{2}{8} = \frac{1}{4}, \frac{RS}{GH} = \frac{1}{4} \text{ and } \frac{SP}{HE} = \frac{1}{4}$$

- (b) Is rectangle PQRS a reduction of rectangle EFGH?

Solution: Yes

- (c) If PQRS is a reduction of EFGH, what is the scale factor?



Solution: $\frac{1}{4}$

(d) What is the perimeter and area of PQRS and EFGH?

$$\left. \begin{array}{l} \text{Perimeter of PQRS} = 2(4 + 2) = 12 \text{ units} \\ \text{Perimeter of EFGH} = 2(16+8) = 48 \text{ units} \end{array} \right\} \frac{12}{48} = \frac{1}{4}$$

$$\left. \begin{array}{l} \text{Area of PQRS} = 4 \times 2 = 8 \text{ units}^2 \\ \text{Area of EFGH} = 16 \times 8 = 128 \text{ units}^2 \end{array} \right\} \frac{8}{128} = \frac{1}{16} = \left(\frac{1}{4}\right)^2$$

Note: PQRS is the image and EFGH is the original object.

5. (a) Calculate $\frac{EF}{AB}$, $\frac{FG}{BC}$, $\frac{GH}{CD}$ and $\frac{HE}{DA}$

$$\frac{EF}{AB} = \frac{16}{8} = 2; \frac{FG}{BC} = \frac{8}{4} = 2; \frac{GH}{CD} = 2 \text{ and } \frac{HE}{DA} = 2$$

(b) Is rectangle EFGH an enlargement of rectangle ABCD?

Solution: **Yes**

(c) If EFGH is an enlargement of ABCD, what is the scale factor?

Solution: **2**

(d) What is the perimeter and area of ABCD and EFGH?

(e) What conclusions can be drawn with regards to area and perimeter of reduced and enlarged object?

Solution: Area of the enlarged image is four times that of the original object and the perimeter of the enlarged image is twice that of the original object.

5. Do you agree or disagree with the following statements?

(a) Perimeter of enlargement/reduction = perimeter of original \times scale factor.

Solution: **Yes**

(b) Area of enlargement/reduction = area of original \times (scale factor)²



Solution: Yes

6. The perimeter of rectangle DEFG = 20 cm and its area = 16 cm^2 . Find the perimeter and area of the enlarged rectangle D'E'F'G' if the scale factor is 3.

$$\text{Perimeter D'E'F'G'} = 20 \text{ cm} \times 3 = 60 \text{ cm}$$

$$\text{Area D'E'F'G'} = 16 \text{ cm}^2 \times (3)^2 = 16 \times 9 = 144 \text{ cm}^2$$

8. CLASSWORK (Suggested time: 15 minutes)

1. The perimeter of $\triangle JKL = 120 \text{ cm}$ and its area = 600 cm^2 . Determine the perimeter and area of the reduced $\triangle J'K'L'$ if the scale factor is 0, 5.

2. The perimeter of quadrilateral PQRS = 30 mm and its area is 50 mm^2 . Find the perimeter and area of quadrilateral P'Q'R'S' if the scale factor is $\frac{1}{5}$.

3. The perimeter of $\triangle STU = 51 \text{ cm}$ and its area is 12 cm^2 . Calculate the perimeter and area of $\triangle S'T'U'$ if the scale factor is $\frac{1}{3}$.

4. The perimeter of a square = 48 m.

(a) Write down the perimeter of the square if the length of each side is doubled.

(b) Will the area of the enlarged square be twice or four times that of the original square?

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)



i) Emphasise that:

- If the scale factor is, for example, 2, the image is enlarged so that its dimensions are twice the original.
- If it is $\frac{1}{2}$, the image is reduced, with its dimensions half the original.
- When the scale factor is 1, the image is the exact same size as the original
- In enlargement, the image and the original are **similar**, in that they are the same shape but not necessarily the same size. They are **not congruent** because that requires them to be the same shape **and** the same size, which they are not (unless the scale factor is 1).

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Select activities from Sasol-Inzalo Book 2 on page 191 to 194 and DBE workbook 2 162 to 167.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – November 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
	1 Hour

1. TOPIC: TRANSFORMATION GEOMETRY: TRANSFORMATIONS (Lesson 5)

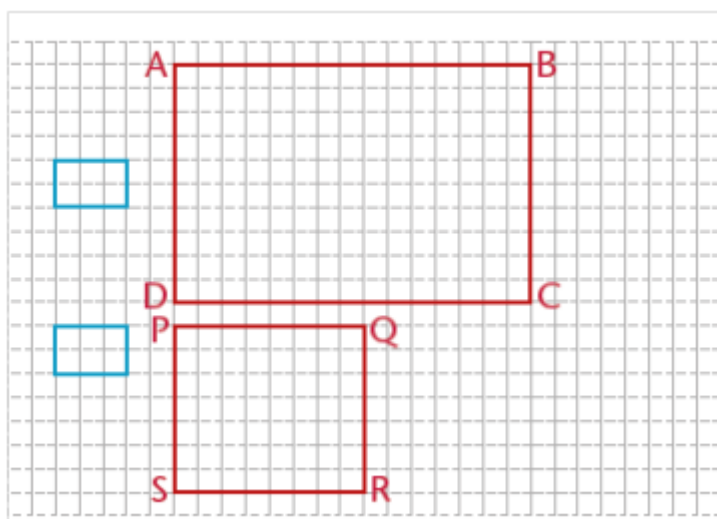
2. CONCEPTS & SKILLS TO BE ACHIEVED

By the end of the lesson learners should know and be able to use proportion to describe the effect of enlargement or reduction on area and perimeter of geometric figures.



3. RESOURCES:	DBE workbook, Sasol-Inzalo workbook, textbook
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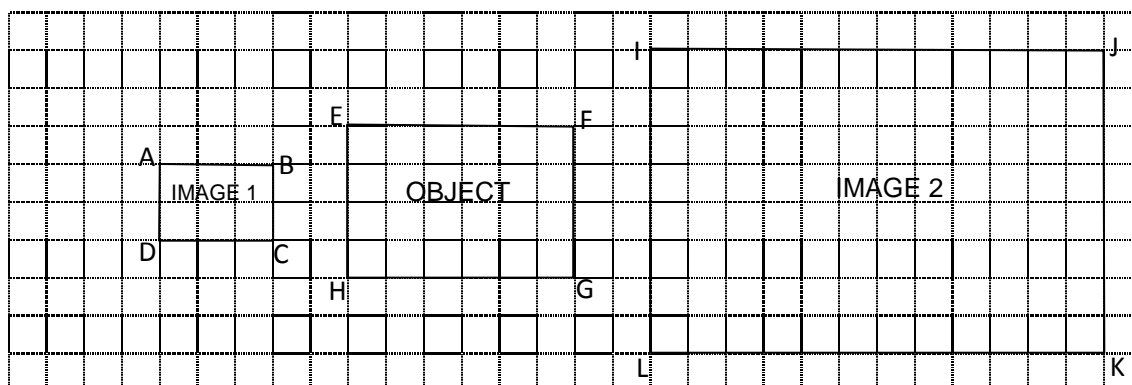
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Hint: when forming ratios, start with the dimensions of the **image** first.

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to :)
---------------------	---

Note: let learners work in pairs to answer the questions that follow:

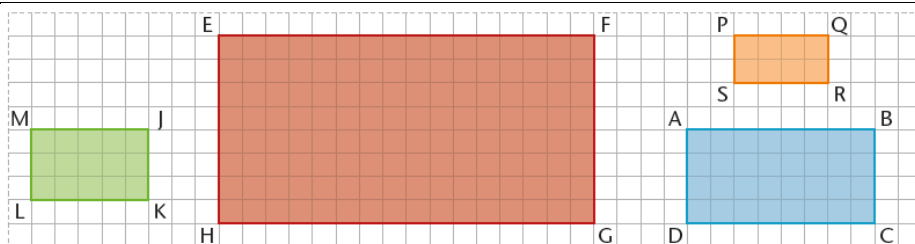
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Solution: No

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- (b) Is rectangle PQRS a reduction of rectangle EFGH?

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Solution: **Yes**

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8. CLASSWORK (Suggested time: 15 minutes)

1. The perimeter of $\triangle JKL = 120 \text{ cm}$ and its area = 600 cm^2 . Determine the perimeter and area of the reduced $\triangle J'K'L'$ if the scale factor is 0, 5.

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(a) Write down the perimeter of the square if the length of each side is doubled.

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9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)



k) Emphasise that:

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MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

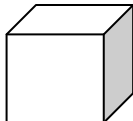
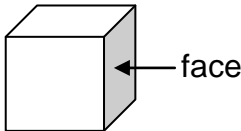
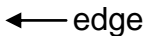



PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GEOMETRY OF 3D OBJECTS: CLASSIFYING 3D OBJECTS (Lesson 1)

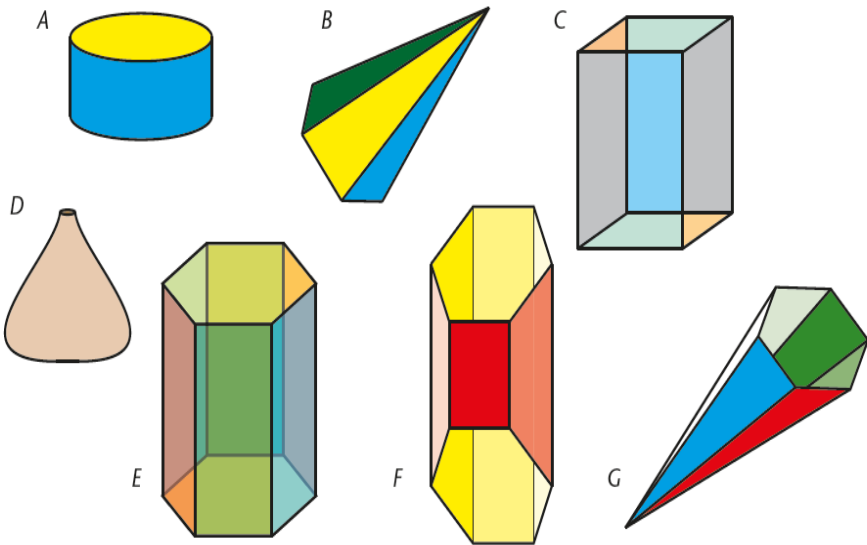
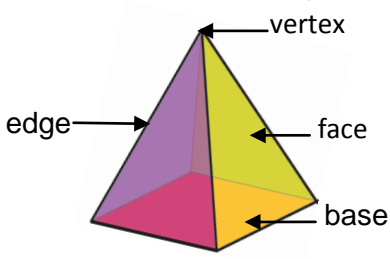
2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to describe, name and compare the 5 platonic solids in terms of the shape and number of faces, the number of vertices and the number of edges.

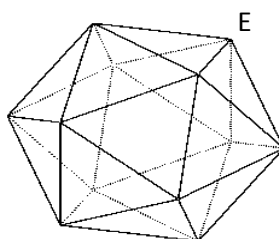
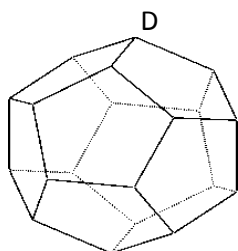
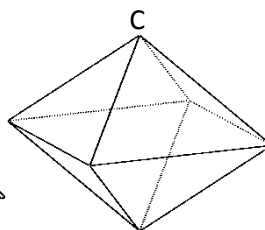
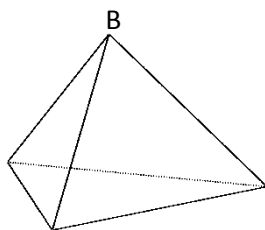
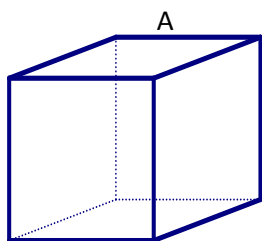


3. RESOURCES:	DBE workbook 2, Sasol-Inzalo workbook 2, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> polygons properties of polygons equations
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Activity : Revise with learners the work on 3D objects done in grade 7 by asking them to:</p> <ul style="list-style-type: none"> define: <ul style="list-style-type: none"> ➤ Polyhedron: A polyhedron is a 3D object with flat faces (surfaces) only or a solid shape whose faces are all polygons, e.g. a cube <div style="text-align: center;">  </div> <ul style="list-style-type: none"> ➤ Face: A face is a flat surface of a solid. A cube has six (6) faces. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> ➤ Edge: A line where two faces meet. A cube has 12 edges. <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> ➤ Vertex: A point where three or more edges meet. A cube has 8 vertices. <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> Ask learners to list names of all polyhedrons which they know or learnt about in grade 7. 	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to:)
<p>Present the following activities to learners:</p> <p>Activity 1: Consider the geometric objects below:</p>  <p>a) Which of the objects above are polyhedrons? b) Which of the polyhedrons in (a) are prisms? c) Which of the objects in (a) are pyramids?</p> <p>Solutions:</p> <p>a) B C E F and G b) C and E c) B and G</p> <p>Activity 2: Describe the differences between prisms and pyramids. Solution:</p> <p>Prism: A prism is a special type of a polyhedron. Two of the faces of a prism are parallel identical (congruent) faces; the rest of the faces are either rectangles or parallelograms. Example, in E above the bottom and top faces are parallel identical (hexagons) and the rest are rectangles.</p> <p>Pyramid: A pyramid is a special type of a polyhedron. The base of the pyramid can be any polygon but the rest of the faces are all triangles. In the pyramid below, the base is a square and all the other faces are triangles.</p> 	<p>be actively engaged by answering questions during lesson presentation.</p>

Activity 3: Consider the polyhedrons below:



Study the polyhedrons, and then answer questions based on them.

- Which of the above polyhedrons are prisms or pyramids?
- What can you say about the faces of each polyhedron?

Solutions:

- Polyhedron A is a prism and Polyhedron B is a pyramid.
- Polyhedron A: All faces are congruent regular Squares.
Polyhedrons B, C and E: All faces are congruent regular triangles.
Polyhedron D: All faces are congruent regular pentagons.

Note: All polyhedrons whose faces are congruent regular polygons are called Platonic solids.

8. CLASSWORK (Suggested time: 15 minutes)

Sasol-Inzalo workbook 2 page 203 no. 4 and 6, page 2014 no. 6



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

aa) **Emphasise that:**

- a face is a (flat/curved) surface of a solid.
- a vertex is a point where three or more edges meet.
- an edge is a point where two faces meet.
- The word polyhedron means 'many seated' and describes the shape of such an object with many flat faces.

bb) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

- DBE workbook 2 page 174 no. 1
- Sasol-Inzalo workbook 2 page 204 no. 7



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

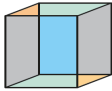
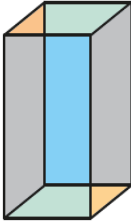
PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GEOMETRY OF 3D OBJECTS: CLASSIFYING 3D OBJECTS (Lesson 2)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to describe, name and compare the 5 platonic solids in terms of the shape and number of faces, the number of vertices and the number of edges.



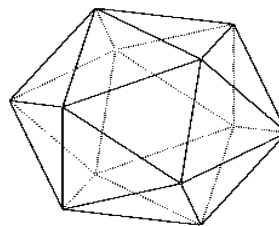
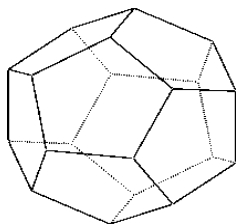
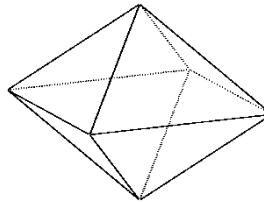
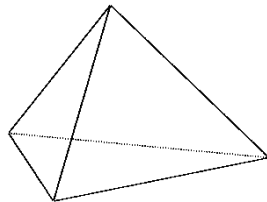
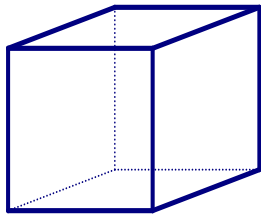
3. RESOURCES:	DBE workbook 2, Sasol-Inzalo workbook 2, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> polygons properties of polygons equations
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION (Suggested time: 10 Minutes) Present the activity below to the learners and ask them to provide answers to the questions based on the activity. Activity: Consider the following polyhedra: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>A</p> </div> <div style="text-align: center;">  <p>B</p> </div> </div> <ol style="list-style-type: none"> Are polyhedra A and B prisms or pyramids? Name each polyhedron. How many faces does each polyhedron have? Compare the faces of polyhedron A and B according to polygons of which each polyhedron is constructed. <p>Solutions (Discuss these solutions with learners):</p> <ol style="list-style-type: none"> Both A and B are prisms. Polyhedron A is a cube and polyhedron B is a square prism. Polyhedron A has six (6) and polyhedron B has six (6). Polyhedron A (Cube) has same faces which are squares. Polyhedron B (Square prism) has two same faces (squares) and four same faces (rectangles). <p>Note:</p> <ul style="list-style-type: none"> Polyhedra with same faces (e.g. polyhedron A) are special kind of polyhedra called platonic solids. Their faces are congruent regular polygons such as equilateral triangles, squares and regular pentagons. Polyhedron B (Square prism) has irregular phases. There are five (5) regular polyhedra (Platonic solids): Tetrahedron, hexahedron, octahedron, dodecahedron and icosahedron. 	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities

Present the activity below to the learners and ask learners to provide answers to the questions based on the activity:

Study the drawings of the five Platonic solids below:



Note: Enlarge the illustrations of the Platonic solids above and make enough copies for the learners.

Activity:

1. For each of the platonic solids, compare the number of faces that meet at each of the vertices.
2. Complete the following table, using the platonic solids given above.

Solid	Tetrahedron	Hexahedron (cube)	Octahedron	Dodecahedron	Icosahedron
No. of faces	4	6	8	12	20
No. of faces meeting at each vertex					
Shape of faces					

Solution: (Discuss with learners)

1. The same number of faces meets at each of their vertices in each platonic solid.
2. See the solutions in **purple** in the table below:

Learning activities (Learners are expected to:)

actively engaged throughout the lesson presentation by answering questions.



Solid	Tetrahedron	Hexahedron (cube)	Octahedron	Dodecahedron	Icosahedron
No. of faces	4	6	8	12	20
No. of faces meeting at each vertex	3	3	4	3	5
Shape of faces	triangles	squares	triangles	pentagons	triangles

8. CLASSWORK (Suggested time: 15 minutes)

DBE workbook 2 page 174 no. 1 (a) to (g)

9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

cc) **Emphasise that:**

- Regular polyhedra are known as Platonic solids.
- Faces of regular polyhedra are congruent regular polygons such as squares, equilateral triangles and regular pentagons.

dd) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

DBE workbook 2 page 169 no. 4 and 5



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

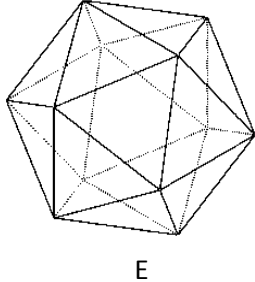
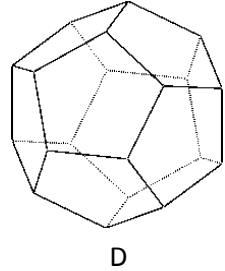
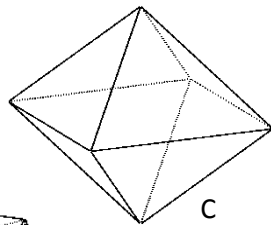
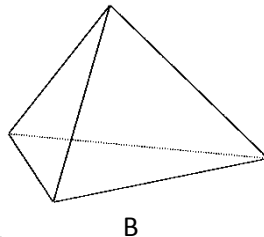
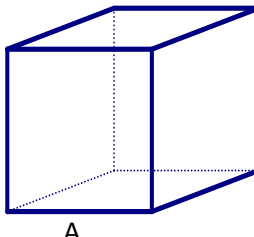
PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: GEOMETRY OF 3D OBJECTS: CLASSIFYING 3D OBJECTS (Lesson 3)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to describe, name and compare the 5 platonic solids in terms of the shape and number of faces, the number of vertices and the number of edges.



3. RESOURCES:	DBE workbook 2, Sasol-Inzalo workbook 2, textbook																								
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none">polygonsproperties of polygonsequations																								
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes)																									
<p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>																									
6. INTRODUCTION (Suggested time: 10 Minutes)																									
<p>Recap with learners the work done on the previous day (lesson 2) regarding platonic solids by presenting the following activity:</p> <p>Activity: Study the Platonic solids below:</p>																									
<div></div>																									
<p>(i) Name each platonic solid and indicate the number of faces.</p> <p>(ii) Name the shape of the faces of each platonic solid.</p>																									
Solution:																									
<table><tr><th>Solid</th><th>Name</th><th>Number of faces</th><th>Shape of the faces</th></tr><tr><td>A</td><td>Hexahedron (Cube)</td><td>6</td><td>Squares</td></tr><tr><td>B</td><td>Tetrahedron</td><td>4</td><td>Triangles</td></tr><tr><td>C</td><td>Octahedron</td><td>8</td><td>Triangles</td></tr><tr><td>D</td><td>dodecahedron</td><td>12</td><td>Pentagons</td></tr><tr><td>E</td><td>Icosahedron</td><td>20</td><td>Triangles</td></tr></table>		Solid	Name	Number of faces	Shape of the faces	A	Hexahedron (Cube)	6	Squares	B	Tetrahedron	4	Triangles	C	Octahedron	8	Triangles	D	dodecahedron	12	Pentagons	E	Icosahedron	20	Triangles
Solid	Name	Number of faces	Shape of the faces																						
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B	Tetrahedron	4	Triangles																						
C	Octahedron	8	Triangles																						
D	dodecahedron	12	Pentagons																						
E	Icosahedron	20	Triangles																						
<p>Note: The names of these solids come from: Tetra (4), octa (8), dodeca (12) and Icosa (20)</p>																									



7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to:)																																																
<p>Present the following activity to learners and ask them to answer all questions based on the activity:</p> <p>Activity 1: Complete the table below to investigate the relationship between the number of faces, vertices and edges of the Platonic solids. Use the illustrations of the Platonic solids in the introduction.</p> <table><tr><th>Name</th><th>Faces (F)</th><th>Vertices (V)</th><th>Edges (E)</th></tr><tr><td>Hexahedron</td><td>6</td><td>8</td><td>12</td></tr><tr><td>Octahedron</td><td></td><td></td><td></td></tr><tr><td>Tetrahedron</td><td></td><td></td><td></td></tr><tr><td>Dodecahedron</td><td></td><td></td><td></td></tr><tr><td>Icosahedron</td><td></td><td></td><td></td></tr></table> <p>Solution:</p> <table><tr><th>Name</th><th>Faces (F)</th><th>Vertices (V)</th><th>Edges (E)</th></tr><tr><td>Hexahedron</td><td>6</td><td>8</td><td>12</td></tr><tr><td>Octahedron</td><td>8</td><td>6</td><td>12</td></tr><tr><td>Tetrahedron</td><td>4</td><td>4</td><td>6</td></tr><tr><td>Dodecahedron</td><td>12</td><td>20</td><td>30</td></tr><tr><td>Icosahedron</td><td>20</td><td>12</td><td>30</td></tr></table> <p>Activity 2: Use the completed table to answer the following:</p> <ul style="list-style-type: none">a) Write the general rule which illustrates the relationship between the number of faces, vertices and edges.b) Which Platonic solids have the same number of edges?c) Which Platonic solid has the highest number of faces?d) Which Platonic solid has the highest number of vertices <p>Solution:</p> <ul style="list-style-type: none">a) The general rule: $V + F - E = 2$.b) Hexahedron and Octahedron, Dodecahedron and Icosahedron.c) Icosahedron.d) Dodecahedron.	Name	Faces (F)	Vertices (V)	Edges (E)	Hexahedron	6	8	12	Octahedron				Tetrahedron				Dodecahedron				Icosahedron				Name	Faces (F)	Vertices (V)	Edges (E)	Hexahedron	6	8	12	Octahedron	8	6	12	Tetrahedron	4	4	6	Dodecahedron	12	20	30	Icosahedron	20	12	30	<p>actively engaged throughout the lesson presentation.</p> <p>Do activity 1 and 2 in groups</p>
Name	Faces (F)	Vertices (V)	Edges (E)																																														
Hexahedron	6	8	12																																														
Octahedron																																																	
Tetrahedron																																																	
Dodecahedron																																																	
Icosahedron																																																	
Name	Faces (F)	Vertices (V)	Edges (E)																																														
Hexahedron	6	8	12																																														
Octahedron	8	6	12																																														
Tetrahedron	4	4	6																																														
Dodecahedron	12	20	30																																														
Icosahedron	20	12	30																																														

8. CLASSWORK (Suggested time: 15 minutes)

DBE workbook 2 page 168 no. 1



9. CONSOLIDATION/CONCLUSION & HOMEWORK (Suggested time: 5 minutes)

ee) Emphasise that:

- The name of each platonic solid is derived from the number of faces.
- Platonic solids provides an interesting context in which to investigate the relationship between the number of faces, vertices and edges.
- Learners should investigate the pattern that emerges, to come up with the general rule:
 $V - E + F = 2$, where V = number of vertices, E = number of edges and F = number of faces.

ff) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

1. Complete the following table.

(Use the information on the completed table done during the lesson presentation).

Platonic solid	Tetrahedron	Hexahedron	Octahedron	Dodecahedron	Icosahedron
$E + F + V$					
$E - V + F$					
$V - E + F$					
$E - F + V$					

2. What do you notice about the value of $V - E + F$ for all the platonic solids?
3. What do you call the formula of the answer in 2 above?



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: Geometry of 3D objects Building 3D models (Lesson 4)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to use nets to make models of cubes and prisms.



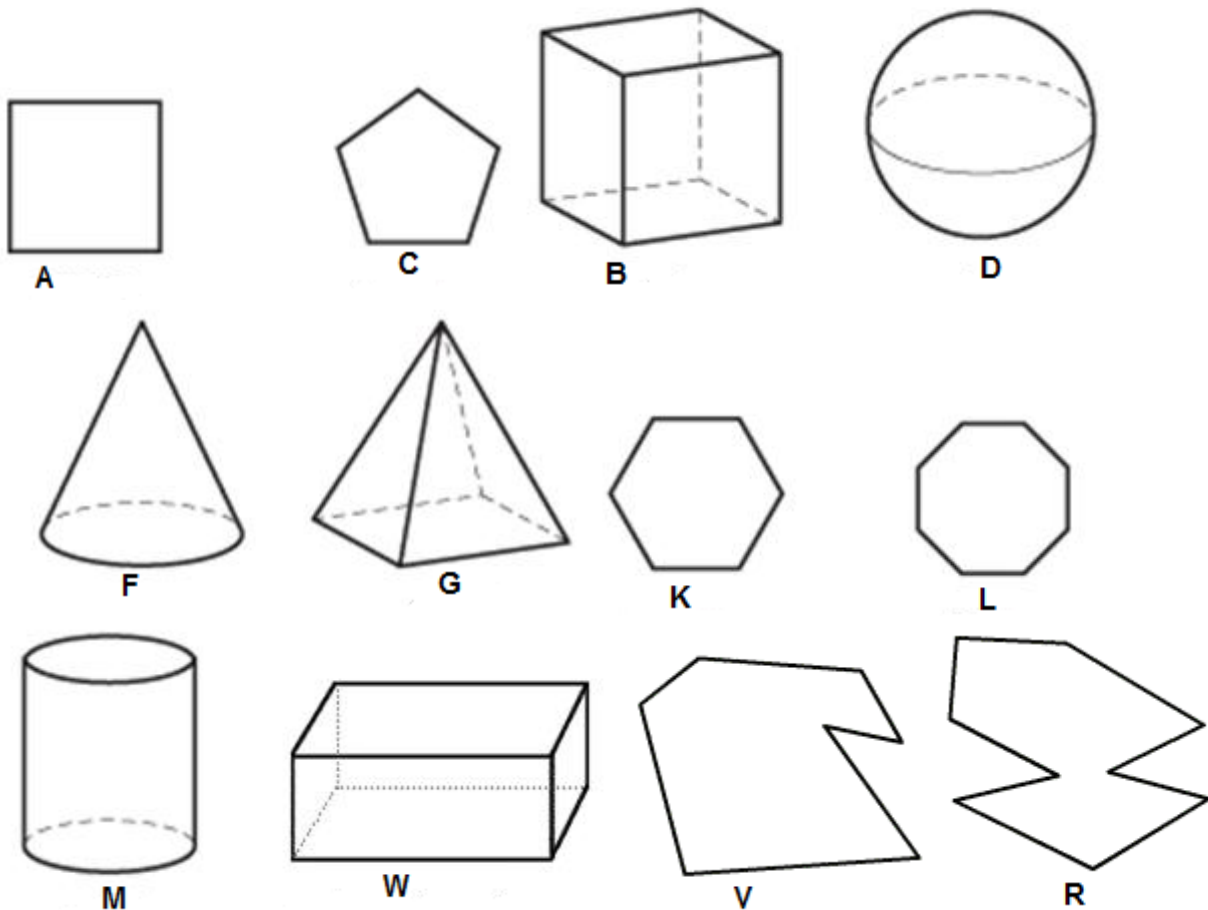
3. RESOURCES:	Textbook , Sasol-Inzalo Book 2, sticky tape, ruler, pair scissors
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • Polygon • Polyhedron • Prism • Pyramid • Nets • Apex • Edge • Face • Vertex.
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	



6. INTRODUCTION (Suggested time: 10 Minutes)

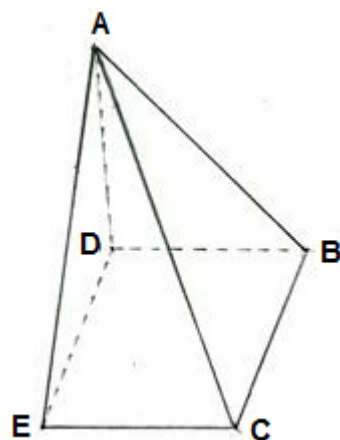
The teacher ask learners to respond to the questions below

(a) Identify the following figures as polygon or polyhedra



(b) Classify the identified polyhedra in question 1 as Prism and Pyramids

(c) Identify the following terms Apex, Edge, Face and vertex in the figure and describe the meaning of each term



7. LESSON PRESENTATION/DEVELOPMENT(Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to)
<p>Do the activity together with the learners.</p> <p>Instructions:</p> <ul style="list-style-type: none"> • Draw the square of 10 units on a grid or square paper • Use it as stencil to construct the net of a cube • Use the net to build a cube 	<p>Do activities 1 and 2 under classwork.</p>

8. CLASSWORK(Suggested time: 15 minutes)

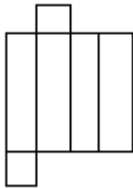
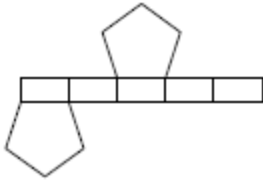
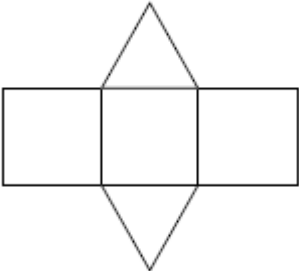
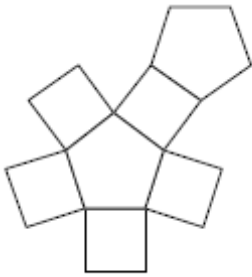
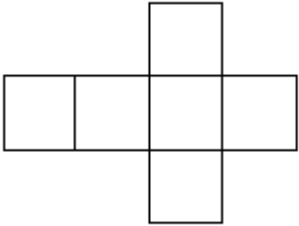
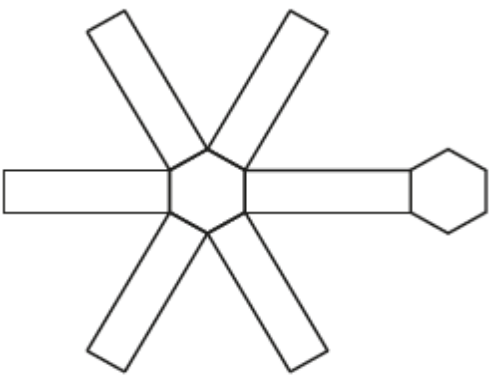
Activity 1

Instructions:

- Draw the rectangle of dimensions 15 cm x 10 cm and square of 10 cm of on a grid paper
- Use the drawn square and rectangle as stencil to construct the net of a solid.
- Use the net to build a solid.
- What is the name of the solid?

Activity 2

Identify each solid of the given net.

<p>a)</p> 	<p>b)</p> 	<p>c)</p> 
<p>d)</p> 	<p>e)</p> 	<p>f)</p> 

9. CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)

gg) **Emphasise that:**

- Object may have more than one nets
- Polygons may not be regular.
- Drawing of net may preferably be done on a grid paper.

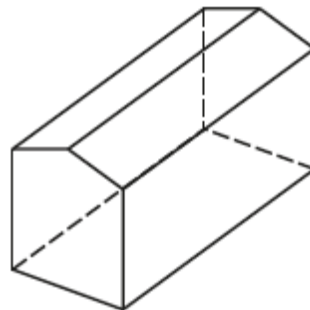
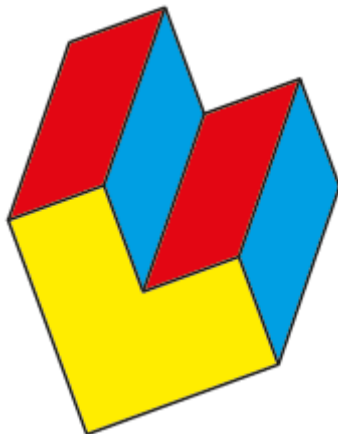
hh) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

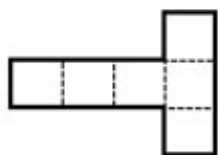
Activity 1

- Constructs accurate net triangular prism with a height of 10 cm and the base with dimensions of 5cm, 6 cm and 7cm.
- Sasol-Inzalo Book 2 Page 208 – 209 no 4(a, c, d, e, i, and j)
- Draw the nets of the figures below

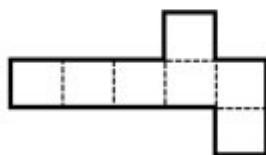


Activity 2

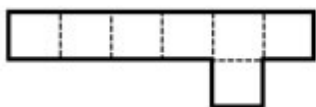
Which of the following are possible nets of cube and which are not?



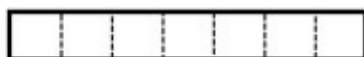
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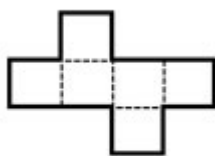
B



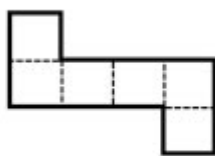
E



F



C



D



G

MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

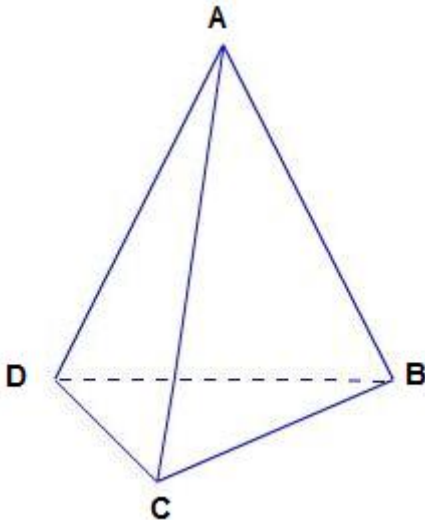
PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: Geometry of 3D objects Building 3D models: (Lesson 5)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to use nets to make models of pyramids.



3. RESOURCES:	Textbook ,Sasol-Inzalo Book 2, Sticky tape, Ruler, Pair of scissors
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • Polygons • Polyhedron • Prism • Pyramid • Nets • Apex • Edge • Face • Vertex.
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION(Suggested time: 10 Minutes) <p>Identify parts in a pyramid below.</p> <p>(i) What do we call point A, B, C and D</p> <p>(ii) What is the special name for point A?</p> <p>(iii) What is the special name for polygon BCD?</p> <div style="text-align: center;">  </div>	

7. LESSON PRESENTATION/DEVELOPMENT(Suggested time: 20 minutes)

Teaching activities	Learning activities (Learners are expected to :)
<p>Do this activity together with learners and allow learners to do activity under class work</p> <p>Activity</p> <p>Instructions</p> <ul style="list-style-type: none">• Draw the equilateral triangle of 10 cm on a grid or squared paper.• Use it as stencil to make 6 copies of the equilateral triangle.• Use sticky tape to create a pyramid with 3 triangles placed together to form a vertex.• What is the shape of the base?	<p>do activities under classwork</p>

8. CLASSWORK(Suggested time: 15 minutes)

Instructions

- Draw the equilateral triangle of 8 cm on a grid or square paper
- Use it as stencil to make 6 copies of the equilateral triangle.
- Use sticky tape to create a pyramid with 4 triangles placed together to form a vertex.

Answer the following questions

- (i) What is the shape of the base?
- (ii) What is the name of a solid formed?

9. CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)

ii) **Emphasise that:**

- Object may have more than one nets
- Polygons may not be regular.
- Drawing of net may preferably be done on a grid paper.

- jj) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo book 2, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.



Homework:

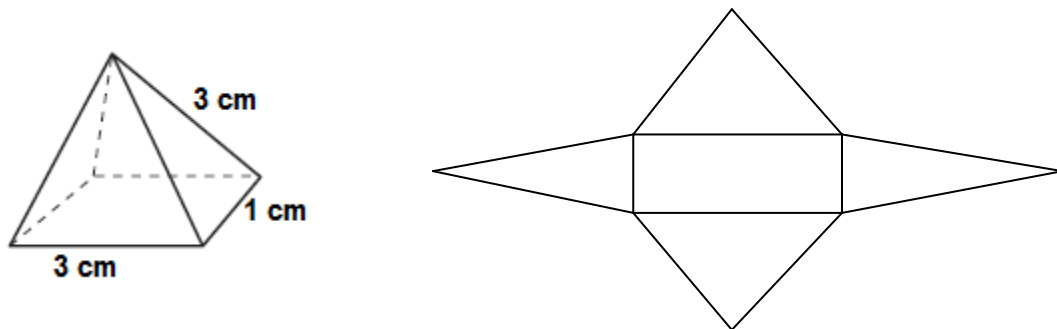
Activity 1

Instructions

- Draw the equilateral triangle of 30mm on a grid or square paper
 - Use it as stencil to make 6 copies of the equilateral triangle.
 - Create a pyramid with 5 triangles placed together to form a vertex
- (a) What shape is the base?
- (b) Is it possible to form the vertex of a pyramid using 2 equilateral triangles and 6 equilateral triangles? Give reasons for your answer.
- (c) Draw a pyramid with 6 faces

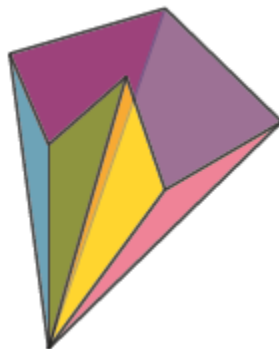
Activity 2

Below are the solid and its net. Write measurements on the sides of the given net below.



Activity 3

Construct the net of a figure below



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: PROBABILITY : (Lesson 1)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to

- Consider a simple situation with equally likely outcomes) that can be described using probability and list all the possible outcomes.

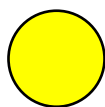


3. RESOURCES:	DBE Workbook, Sasol-Inzalo workbook, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • Outcome • Probability
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION(Suggested time: 10 Minutes) Ask learners to define the concept outcome NB: Outcome is the result of an event, for example a tossed coin landing on Head up.	
7. LESSON PRESENTATION/DEVELOPMENT(Suggested time: 20 minutes)	
Teaching activities	Learning activities (Learners are expected to:)

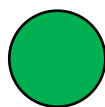


Allow learners to complete the following activity in their groups

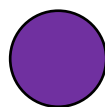
Activity 1



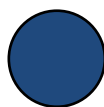
Yellow



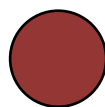
Green



Purple



Blue



Red

Imagine that you have five coloured buttons as shown above in the paper bag.

1. Imagine that you put your hand into the bag without looking inside, and grab one of the buttons.
 - a) Can you say which colour will that button be?
 - b) Discuss this with your group
2. What are the different possible colours that you could draw from the bag? And how many different possibilities are there?
3. Allow learners to read the passage below then answer the questions that follow.

When you draw a button from the bag, we say you perform a **trial**. The colour you draw is called the **outcome** of the trial.

 - a) What are the different possible outcomes if you draw one button out of the bag?
 - b) Imagine that you put the first button back into the bag again. What are the possible outcomes of this new trial?
 - c) Imagine that you repeat the event for the third time. What are the possible outcomes of this new trial?
 - d) Imagine that you perform many trials. What are the possible outcomes of each repetition?
4. When you draw one of the five buttons many times and put it back each time, do you think you will draw one colour more often than the others?

NB: The purpose of this activity is to make learners understand the notion of **equally likely**. That is when there is no reason to believe that any outcome will occur more often than any other outcome, the outcomes are said to be **equally likely**.

Complete the activity



8. CLASSWORK(Suggested time: 15 minutes)

Sasol-Inzalo workbook pages

- 231 number 1 and 2

9. CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)

kk) **Emphasise that:**

- The values 0 and 1 are the extremes of probability and the probability of an outcome occurring can be anywhere between 0 and 1
- The nearer a probability is to 0 on the scale, the less likely the outcome is.
- The nearer a probability is to 1, the more likely the outcome

ll) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: PROBABILITY : (Lesson 2)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to

- Consider a simple situation (with equally likely outcomes) that can be described using probability and determine the probability of each possible outcome using the definition of probability.



3. RESOURCES:	DBE workbook, Sasol-Inzalo workbook, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • Probability • Outcomes • Frequency
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Activity 1 Present the following activity to the learners Fifteen playing cards are marked 1 to 15 and 1 card is drawn at random. What is the probability that it</p> <ul style="list-style-type: none"> a) Is an even number b) Contains two digits c) Contains the digit 1? <p>NB. Encourage learners to list numbers as shown below.</p> <p>Cards numbers : 1; 2; 3; 4; 5; 6; 7; 8; 9; 10; 11; 12; 13; 14; 15</p> <ul style="list-style-type: none"> a) $\frac{7}{15}$ (2; 4; 6; 8; 10; 12; 14) b) $\frac{6}{15}$ (10; 11; 12; 13; 14; 15) c) $\frac{7}{15}$ (1; 10; 11; 12; 13; 14; 15) 	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)	
Teaching activities	Learning activities (Learners are expected to 😊)



Do the following activity with learners

Activity 1

A single 6-sided die is rolled.

- a) What is the probability of each outcome?
- b) What is the probability of rolling an even number?
- c) What is the probability of rolling an odd number?
- d) Which of the following is the most likely number thrown?

A Prime number B Factor of 6 C Factor of 12

Solutions

Outcomes : The possible outcomes for this experiment are 1; 2; 3; 4; 5 and 6.

- a) Probabilities

$$P(1) = \frac{\text{total number of ways to roll a 1}}{\text{Total number of sides}} = \frac{1}{6}$$

$$P(2) = \frac{\text{total number of ways to roll a 2}}{\text{Total number of sides}} = \frac{1}{6}$$

$$P(3) = \frac{\text{total number of ways to roll a 3}}{\text{Total number of sides}} = \frac{1}{6}$$

$$P(4) = \frac{\text{total number of ways to roll a 4}}{\text{Total number of sides}} = \frac{1}{6}$$

$$P(5) = \frac{\text{total number of ways to roll a 5}}{\text{Total number of sides}} = \frac{1}{6}$$

$$P(6) = \frac{\text{total number of ways to roll a 6}}{\text{Total number of sides}} = \frac{1}{6}$$

$$\text{b) } P(\text{even}) = \frac{\text{total number of ways to roll an even number}}{\text{Total number of sides}} = \frac{3}{6} = \frac{1}{2}$$

$$\text{c) } P(\text{odd}) = \frac{\text{total number of ways to roll an odd number}}{\text{Total number of sides}} = \frac{3}{6} = \frac{1}{2}$$



d) The most likely number thrown is the multiple of 12	
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8. CLASSWORK(Suggested time: 15 minutes)

Sasol-Inzalo workbook pages 238 to 239, 13 (a) – (d)

9. CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)

mm) **Emphasise that:**

- Probability is about estimating the chance of an event happening during an activity, and studying trends and patterns. The outcome is the result of this activity.
- We can write probability as a formula **Probability** = $\frac{\text{the number of favourable outcomes}}{\text{the number of possible outcomes}}$

nn) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding. Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive level

HOMEWORK

DBE Workbook page 152 no 1



MATHEMATICS LESSON PLAN

GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: PROBABILITY : PREDICT, WITH REASONS, THE RELATIVE FREQUENCY OF THE POSSIBLE OUTCOMES FOR A SERIES OF TRIALS BASED ON PROBABILITY (**Lesson 3**)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to

- Consider a simple situation (with equally likely outcomes) that can be described using probability and predict, with reasons, the relative frequency of the possible outcomes for a series of trials based on probability.



3. RESOURCES :	Sasol-Inzalo workbook, DBE workbook, textbook, dice.
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • Probability,
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.	
6. INTRODUCTION(Suggested time: 10 Minutes) Relative frequency is also known as experimental probability. Relative frequency of an outcome is the ratio between the number of times the outcome occurred and the total number of times the experiment was done. <i>Relative Frequency</i> = $\frac{\text{the number of times an event occurs}}{\text{the total number of trials}}$	

7. LESSON PRESENTATION/DEVELOPMENT(Suggested time: 20 minutes)	
Teaching activities	Learning activities (Learners are expected to :)



Activity 1

Divide learners into small groups and allow them to complete the following activity. (Learners may be allowed to generate data for themselves).

A dice is rolled 40 times and the number that faces upward each time the dice land is recorded :

2 5 4 1 1 6 3 1 2 2 1 5 3 1 1 3 6 6 3 1 3 6 4 5 6 6 1 5 5 6 2 3 3 1 4 6 2 4 1 4

What is the relative frequency of the result being

1. 1?
2. 2?
3. 3?
4. 4?
5. 5?
6. 6?

Answers

NB: Guide learners to draw a tally table to record results and to determine the frequency of every outcome.

Possible Outcomes	1	2	3	4	5	6
Tally	 					
Frequency	10	5	7	5	5	8

Relative frequency = $\frac{\text{the number of times an event occurs}}{\text{the number of trials}}$

1. The relative frequency for the outcome 1 is $\frac{10}{40} = \frac{1}{4}$, or 25%
2. The relative frequency for the outcome 2 is $\frac{5}{40} = \frac{1}{8}$, or 12,5%
3. The relative frequency for the outcome 3 is $\frac{7}{40}$, or 17,5%
4. The relative frequency for the outcome 4 is $\frac{5}{40} = \frac{1}{8}$, or 12,5%

Discuss the activity and respond to questions.



5. The relative frequency for the outcome 5 is $\frac{5}{40} = \frac{1}{8}$, or 12,5%
6. The relative frequency for the outcome 6 is $\frac{8}{40} = \frac{1}{5}$, or 20%

NB: The probability of rolling a 2, for example is

$\frac{1}{6}$ (or 16,7% rounded off), which differs from the relative frequency $\frac{1}{8}$ or 12,5%

of that outcome in this experiment. The more times you roll the die, the closer the relative frequency of the outcome will get to the probability of $\frac{1}{6}$.

At this stage learners must notice that the relative frequency of an outcome = $\frac{f}{N}$ where f is the number of times that the outcome occurs and N is the total number of trials performed.

So, $f = \text{relative frequency} \times N$. The more times that we perform the trial (that is the larger N, the closer the relative frequency comes to the probability of the corresponding event E happening.

8. CLASSWORK(Suggested time: 15 minutes)

Sasol-Inzalo workbook pages 238 to 239, 13 (a) – (d)

9. CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)

oo) **Emphasise that :**

- The more times that we perform the trial, the closer the relative frequency comes to the probability of the corresponding event E happening.
- If the random experiment is repeated N times, and some outcomes occurred f times, then the relative frequency of the outcome is represented by the ratio $\frac{f}{N}$
- The relative frequency of an outcome can be used to estimate or predict the probability of that outcome occurring.

pp) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.

Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.

Homework:

DBE Workbook pages 198 to 199.



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GRADE 8

TERM 4: October – December 2015

PROVINCE:	
DISTRICT:	
SCHOOL:	
TEACHER'S NAME:	
DATE:	
DURATION:	1 Hour

1. TOPIC: PROBABILITY (Lesson 4)

2. CONCEPTS & SKILLS TO BE ACHIEVED:

By the end of the lesson learners should know and be able to

- Consider a simple situation (with equally likely outcomes) that can be described using probability and compare relative frequency with probability and explain possible differences.



3. RESOURCES:	Sasol-Inzalo workbook, DBE Workbook, textbook
4. PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> • probability • relative frequency • fractions, percentages
5. REVIEW AND CORRECTION OF HOMEWORK (suggested time: 10 minutes) <p>Homework provides an opportunity for teachers to track learners' progress in the mastery of mathematics concepts and to identify the problematic areas which require immediate attention. Therefore it is recommended that you place more focus on addressing errors from learner responses that may later become misconceptions.</p>	
6. INTRODUCTION (Suggested time: 10 Minutes) <p>Ask learners the following questions:</p> <ul style="list-style-type: none"> • Differentiate between probability and relative frequency • What is the rule for calculating relative frequency • Calculate the relative frequency of a die which thrown 100 times and lands on 6 a total of 12 times. Give answers in percentages, fractions and decimal form <p>NB: Probability (theoretical probability) is based on equally likely outcomes: that is no bias or error is involved. When there is no reason to believe that any outcome will occur more often than any other outcome, the outcomes are said to be equally likely.</p>	

7. LESSON PRESENTATION/DEVELOPMENT (Suggested time: 20 minutes)	
Teaching activities	Learning activities (Learners are expected to:)
<p>Let learners work in groups to do the following activity.</p> <p>Activity (See annexure A and B)</p> <ul style="list-style-type: none"> • Provide learners with annexure A and allow them to cut out alphabet cards or pieces of paper. • Put the cards in a container. Imagine that you draw a card out of the bag, note the letter and put it back. Imagine that you perform 40 such trials, noting the outcomes each time. Then you find the frequency for each letter. 	<p>Read instructions</p> <p>Cut out cards with 8 different letters and use them to do an investigation.</p>



Questions

1. To what number do you think each of the frequencies will be close? The number you think of may be called the **expected frequency**.
2. What will be the expected frequencies for each letter if
 - a) 200 trials are performed?
 - b) 1 000 trials are performed?

Now actually do the experiment described above. Record your results with tally marks in the table below. When you have finished, count the tally marks to find the **actual frequencies**

	A	B	C	D	E	F	G	H
Tally marks								
Actual frequency								
Expected frequency	5	5	5	5	5	5	5	5

3. Let learners write their actual frequencies on a slip of paper, in a table like this.

	A	B	C	D	E	F	G	H
Actual frequency								

4. The next step is to allow learners to collect the slips of four different groups and write their frequencies in rows 1,4,7,10 and 13 on the table provided together with your own frequencies.

Actually perform the experiment, record their results with tally marks in the table provided.

Collect the slips of four groups and use the data to complete the table.



Note to the teacher: Indicate to learners that when they put the five sets of results together, and add them up, they will have the frequencies out of 200 trials. In the row for expected frequencies, let learners write the numbers to which they think the frequencies will be close.

	A	B	C	D	E	F	G	H
1	Actual frequencies							
2								
3								
4	Actual frequencies							
5								
6								
7	Actual frequencies							
8								
9								
10	Actual frequencies							
11								
12								
13	Actual frequencies							
14								
15								
16	Total actual frequencies							
17								
18								
19	Expected frequencies							
20								
21								

1. Let learners work with their four classmates, and complete the named rows in the table.
2. In the first empty row after each actual frequency row, express the frequency as a fraction of the total number of outcomes in the experiment, which was 40 in each case. They need not to simplify the fractions in rows 2, 5, 8, 11 and 14 of the table.
3. The frequencies of rows 16 and 19 are to be expressed as fractions of 200.
4. In the remaining empty rows, the fractions are to be expressed as percentages
5. Let learners calculate the ranges of the numbers in rows 3, 6, 9,



12, 15 and 18. Row 3 : _____ Row 6 : _____ Row 9 : _____ Row 12: _____ Note to	
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8. CLASSWORK(Suggested time: 15 minutes)
Sasol-Inzalo Book 2 pages 238 number 13 (a)-(d)

9. CONSOLIDATION/CONCLUSION& HOMEWORK (Suggested time: 5 minutes)

qq) **Emphasise that:**

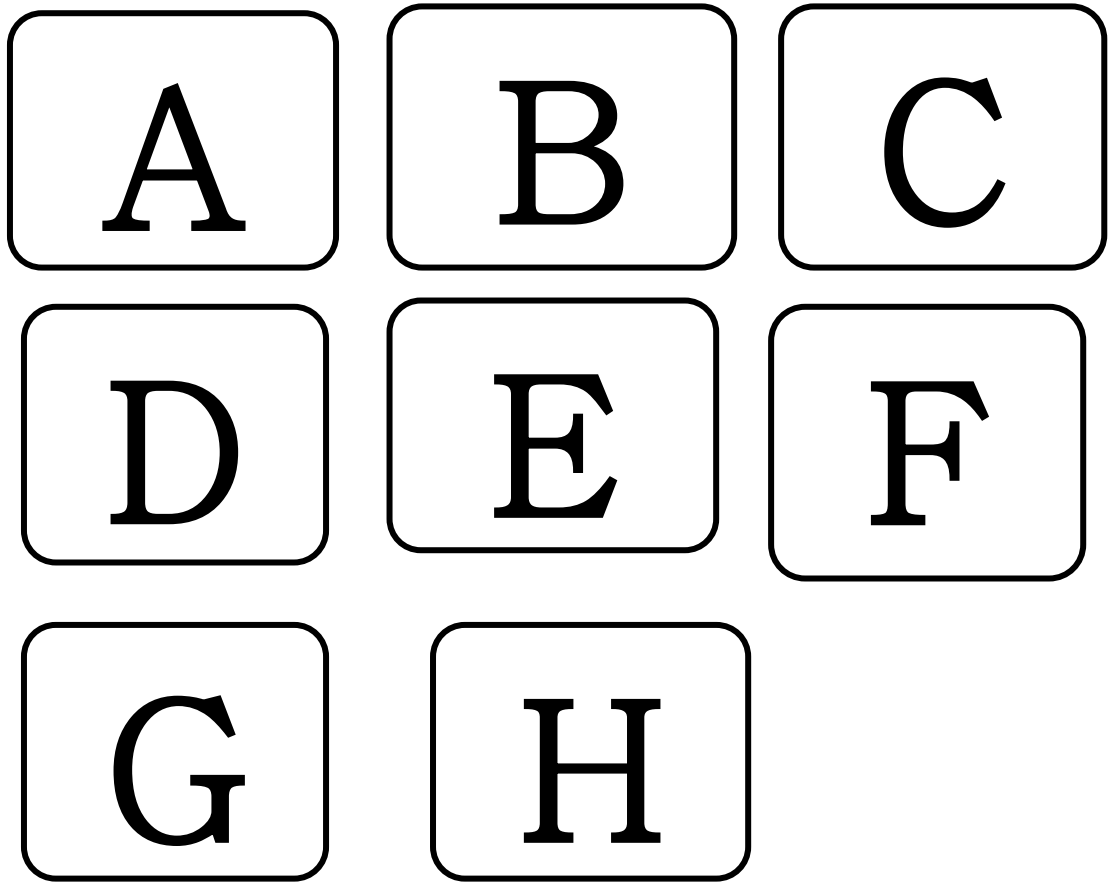
- The expected relative frequency of an outcome is called the probability of the outcome
- The number of times that a specific outcome is obtained during a series of trials is called the frequency of an outcome.
- The more times that we perform the trial, the closer the relative frequency comes to the probability of the corresponding event happening.

rr) The primary purpose of Homework is to give each learner an opportunity to demonstrate mastery of mathematics skills taught in class. Therefore Homework should be purposeful and the principle of 'Less is more' is recommended, i.e. give learners few high quality activities that address variety of skills than many activities that do not enhance learners' conceptual understanding.
Carefully select appropriate activities from the Sasol-Inzalo workbooks, workbooks and/or textbooks for learners' homework. The selected activities should address different cognitive levels.



Annexure A

Cards for the investigation



Annexure B



	A	B	C	D	E	F	G	H
1	Actual frequencies							
2								
3								
4	Actual frequencies							
5								
6								
7	Actual frequencies							
8								
9								
10	Actual frequencies							
11								
12								
13	Actual frequencies							
14								
15								
16	Total actual frequencies							
17								
18								
19	Expected frequencies							
20								
21								