


SECOND TERM LESSON PLAN
MATHEMATICS – B7
WEEK 1

Date: 13 th MAY, 2022	Period:	Subject: Mathematics
Duration: 50MINS		Strand: Number
Class: B7	Class Size:	Sub Strand: Ratios and Proportion
Content Standard: B7.1.4.1 Demonstrate an understanding of the concept of ratios and its relationship to fractions and use it to solve problems that involve rates, ratios, and proportional reasoning		Indicator: B7.1.4.1.1 Find ratio and use ratio language to describe relationship between two quantities.
		Lesson: 1 of 3
Performance Indicator: Learners can use ratio language to describe relationship between two quantities		Core Competencies: CP, CC
References: Mathematics Curriculum Pg. 24-25		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Say: Count the number of chairs and tables (or benches and desks) in the classroom.</p> <p>Write the number of each on the board. (For example: 40 chairs and 10 tables)</p> <p>Ask: How many girls and how many boys are present today?</p> <p>Write the number of each on the board. (For example: 25 girls and 15 boys).</p> <p>Say: Today we will learn how to compare quantities in a ratio format.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to determine ratio of given quantities. Example:</p> <p>Draw 2 oranges and 4 bananas on the board: </p> <p>Say: to compare oranges and bananas we should use the words 'is to'.</p> <p>Write on the board ': ' is to</p> <p>Say: 2 oranges is to 4 bananas.</p> <p>Allow learners to say '2 oranges is to 4 bananas' repeatedly to grasp the concept.</p>	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	<p>Tell learners that the symbol for ‘is to’ is a colon (:).</p> <p>Say: We can now write 2 oranges is to 4 bananas as a ratio. (2:4)</p> <p>Learners to solve more examples.</p> <p>i. There are 60 boys and 120 girls in a school. So the ratio of boys to girls in the school is $\frac{60}{120} = \frac{1}{2}$</p> <p><u>Assessment</u></p> <p>1. Express two quantities as a ratio. i. The ratio of wings to beaks in the bird house at the Kumasi Zoo is 2:1, because for every 2 wings there is 1 beak.</p> <p>2. Describe quantities with ratio language.</p> <p>i. The ratio of Musa to Alhasan’s age is 1:2. If Alhasan is 50 years old and his son, Musa is 25 years old, we can say that</p> <ul style="list-style-type: none"> • Alhasan is twice as old as his son. • Musa is half the age of his father. 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

Date: 13 th MAY, 2022	Period:	Subject: Mathematics
Duration: 50MINS		Strand: Number
Class: B7	Class Size:	Sub Strand: Ratios and Proportion
Content Standard: B7.1.4.1 Demonstrate an understanding of the concept of ratios and its relationship to fractions and use it to solve problems that involve rates, ratios, and proportional reasoning	Indicator: B7.1.4.1.2 Use the concept of a unit rate $\frac{a}{b}$ associated with a ratio a:b with $b \neq 0$, and use rate language in the context of a ratio relationship.	Lesson: 2 of 3
Performance Indicator: Learners can write given ratios as unit rate $\frac{a}{b}$.		Core Competencies: Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 24-25		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Ask a pupil to explain ratio in his/her own words. (Example answer: ratio is a way of comparing two or more quantities).</p> <p>2. Ask another pupil to compare any two quantities in the class in a ratio format. (Example: ratio of benches to tables is 15:20).</p>	
PHASE 2: NEW LEARNING	<p>Write 2 fractions on the board: i) $\frac{18}{20}$ ii) $\frac{25}{30}$.</p> <p>Ask pupils to write the fractions in their simplest form. (Answer: i) $\frac{18}{20} = \frac{9}{10}$ ii) $\frac{25}{30} = \frac{5}{6}$</p> <p>Guide learners to write given ratios as unit rate $\frac{a}{b}$. Example: i. This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ cups of flour for each cup of sugar.</p> <p>Engage learners to practice with more examples.</p> <p><u>Assessment</u> Aisha polishes 8 square yards of floor tiles every 7 minutes, so there are $\frac{8}{7}$ square yards per minute.</p>	Counters, bundle and loose straws base ten cut square, Bundle of sticks
PHASE 3: REFLECTION	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

SECOND TERM LESSON PLAN

MATHEMATICS – B7

WEEK 2

Date: 20 TH MAY, 2022	Period:	Subject: Mathematics
Duration: 50MINS		Strand: Number
Class: B7	Class Size:	Sub Strand: Ratios and Proportion
Content Standard: B7.1.4.1 Demonstrate an understanding of the concept of ratios and its relationship to fractions and use it to solve problems that involve rates, ratios, and proportional reasoning	Indicator: B7.1.4.1.3 Make tables of equivalent ratios (written as common fractions) relating quantities that are proportional.	Lesson:
Performance Indicator:		Core Competencies: Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 25-26		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: NEW LEARNING	Guide learners to use of application of proportion in solving problems in maths. 1. Find the total ratio. The ratio $x:y$ gives you $(x+y)$ 2. Find what one part is. Thus the part corresponding to x , y or z . the share corresponding to x can be found by using the fraction $\frac{x}{x+y}$. Similarly $\frac{y}{x+y}$ Example: Kafui, Adoley and Jantuah shared an amount of money in the ratio of their ages. Kafui is 36 years old, Adoley is 48years and Jantuah is 24years old. If Jantuah received GH¢24000, how much money did they share? First write down their ratios; Kafui : Adoley : Jantuah = 36 : 48 : 24 Their equivalent ratio will be = 3 : 4 : 2 Find their total ratio = 9 Now find what one part is: Jantuah = 24000 that is 2 : 24000 let GH¢ a be the amount shared. Kafui's share = $\frac{3}{9} a$ Adoley's share = $\frac{4}{9} a$	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	<p>Jantuah's share = $\frac{3}{9} \times a = 24000$ $a = \frac{9 \times 24000}{3} = 72000$ therefore the total amount shared is GH¢72000</p> <p>Have learners go ahead to find Kafui and Adoley's share.</p> <p>Let learners practice with more examples.</p> <p><u>Assessment</u></p> <ol style="list-style-type: none"> 1. A man shares his money between his sons Kofi and Kwaku in the ratio 2 : 3. If Kofi's share is 100, find the amount shared and kwaku's share. 2. A green paint is mixed from blue and yellow paint in the ratio 3 : 5. How much of each color is needed to make 40liters of his green paint? 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

Date: 20 TH MAY, 2022	DAY:	Subject: Mathematics
Duration: 50MINS		Strand: Number
Class: B7	Class Size:	Sub Strand: Ratios and Proportion
Content Standard: B7.1.4.1 Demonstrate an understanding of the concept of ratios and its relationship to fractions and use it to solve problems that involve rates, ratios, and proportional reasoning	Indicator: B7.1.4.1.4 Use the proportional reasoning to find missing values in the tables, and plot pairs of values on the coordinate plane.	Lesson:
Performance Indicator: Learners can find missing values in the tables, and plot pairs of values on the coordinate plane		Core Competencies: Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 25-26		

Phase/Duration	Learners Activities	Resources																				
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>																					
PHASE 2: NEW LEARNING	<p>Guide learners to use the proportional reasoning to find missing values in the tables, and plot pairs of values on the coordinate plane</p> <p>Have learners find the missing value marked x in a table of equivalent ratios.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>3</td><td>10</td></tr> <tr><td>6</td><td>x</td></tr> <tr><td>9</td><td>30</td></tr> <tr><td>y</td><td>40</td></tr> </table> <p>$= \frac{x}{6} = \frac{10}{3}$ means the value of $x = \frac{10}{3} \times 6 = \frac{60}{3} = 20$</p> <p>Engage learners to practice with more examples.</p> <p><u>Assessment</u></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td></tr> <tr><td>15</td><td>30</td><td>m</td><td>60</td><td>n</td><td>90</td></tr> </table> <p>Find the values of m and n.</p>	3	10	6	x	9	30	y	40	4	8	12	16	20	24	15	30	m	60	n	90	Counters, bundle and loose straws base ten cut square, Bundle of sticks
3	10																					
6	x																					
9	30																					
y	40																					
4	8	12	16	20	24																	
15	30	m	60	n	90																	
PHASE 3: REFLECTION	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>																					

SECOND TERM LESSON PLAN
MATHEMATICS – B7
WEEK 3

Date: 27 th MAY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Number
Class: B7	Class Size:	Sub Strand: Ratios and Proportion
Content Standard: B7.1.4.1 Demonstrate an understanding of the concept of ratios and its relationship to fractions and use it to solve problems that involve rates, ratios, and proportional reasoning.	Indicator: B7.1.4.1.5 Find a percent of a quantity as a rate per 100.	Lesson: 3 of 3
Performance Indicator: Learners can find a percent of a quantity as a rate per 100		Core Competencies: Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 21		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: NEW LEARNING	Introduce learners to rates. Brainstorm learners for the meaning of rates. Example: <i>A rate is a ratio that compares two quantities with different units of measure.</i> Guide learners to express quantities in rates. ➤ A unit rate is a rate that has 1 unit as its second term, or denominator. Example: Lisa ran 18 miles at a steady pace in 3 hours. Her average speed can be expressed as a ratio: $\frac{18 \text{ miles}}{3 \text{ hours}} = 18 \text{ miles} : 3 \text{ hours} = 18 \text{ miles in } 3 \text{ hours}$ To find how many miles Moya ran in 1 hour, use equivalent ratios. So if 18 miles : 3 hours, then χ miles : 1 hour $= \frac{18 \text{ miles}}{3 \text{ hours}} = \frac{\chi \text{ miles}}{1 \text{ hours}}$ $\rightarrow 18 \times 1 = 3 \times \chi$	Counters, bundle and loose straws base ten cut square, Bundle of sticks

$$\rightarrow 3\chi = 18$$

$$\rightarrow \chi = 6$$

Have learners practice with more examples.

Guide learners to solve problems involving discounts.

A discount is a reduction of the list, or regular, price of an item.

The rate of discount is given as a percent.

The sale price is the difference between the list price and the discount

$$\begin{aligned} \bullet \text{ Discount} &= \text{Rate of Discount} \times \text{List Price} \\ D &= R \times LP \\ \bullet \text{ Sale Price} &= \text{List Price} - \text{Discount} \\ SP &= LP - D \end{aligned}$$

Example:

Some CDs at Fayol's Music World regularly sell for ₺15 each. This week they are being sold at a 15% discount.

What is the discount? What is the sale price?

- To find the discount, D , write an equation and solve for the discount.

$$D = 15\% \text{ of } ₺15$$

$$D = 0.15 \times ₺15$$

$$D = ₺ 2.25$$

The discount on each CD is ₺2.25.

- To find the sale price, SP , write an equation and solve for the sale price.

$$SP = ₺15.00 - ₺2.25$$

$$SP = ₺12.75$$

The sale price of each CD is ₺12.75

Have learners practice with more examples.

Guide learners to solve problems involving commission.

Commission is the amount of money that a salesperson is paid for selling a product or service. The rate of commission is given as a percent.

A salesperson works on straight commission if the commission is the only pay he or she receives

- **Commission = Rate of Commission × Total Sales**

$$C = R \times TS$$
- **Total Earnings = Salary + Commission**

$$TE = S + C$$

Example:

A salesman gets paid 35% commissions. How much commission does he make on sales of GH¢700?

➤ To find the commission, C , write an equation and solve for the commission.

$$C = 35\% \text{ of } \text{¢} 700$$

$$C = 0.35 \times \text{¢} 700$$

$$C = \text{¢} 245$$

Have learners practice with more examples.

Assessment

i. Three rides on the roller coaster cost \$2.25. How much does one ride cost?

ii. Chantal paid GH¢80 for a shirt that was on sale at a discount of 20%. What was the original price?

iii. A cell phone which regularly sells for GH¢450 is on sale for 40% off. How much would you pay for the phone?

iv. A woman put GH¢520 into a savings account for one year. The rate of interest on the account was 6%. How much was the interest for the year?

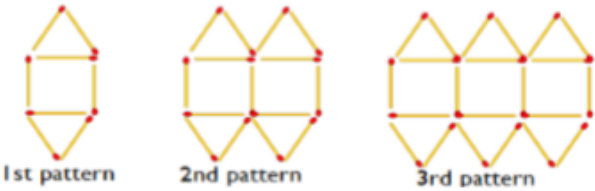
v. During the first hour 250 tickets to a concert were sold. At this rate how long will it be before 1500 tickets are sold?

**PHASE 3:
REFLECTION**

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

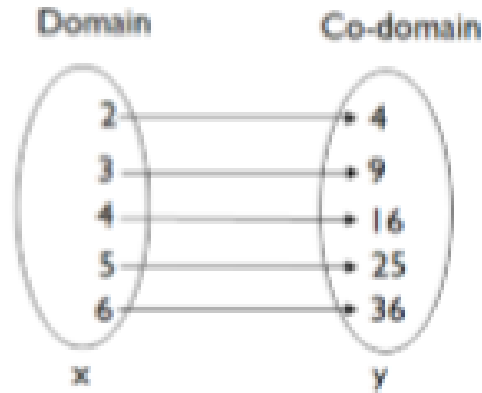
Date:	DAY :	Subject: Mathematics
Duration:	Strand: Algebra	
Class: B7	Class Size:	Sub Strand: Patterns and Relations
Content Standard: B7.2.1.1 Derive the rule for a set of points of a relation, draw a table of values to graph the relation in a number plane and make predictions about subsequent elements of the relation.	Indicator: B7.2.1.1.1 Extend a given relation presented with and without symbolic materials and explain how each element differs from the preceding one.	Lesson: 1 of 3
Performance Indicator: Learners can predict subsequent elements in a given pattern		Core Competencies: Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 27-28		

Phase/Duration	Learners Activities	Resources																																
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>																																	
PHASE 2: NEW LEARNING	<p>Guide learners to extend a given symbolic relation.</p>  <p>1st pattern 2nd pattern 3rd pattern</p> <p>Let learners study the pattern made with match sticks below and draw the fifth pattern.</p> <p>Learners to analyze How each pattern differ from the pattern that comes before it?</p> <p>Have learners to copy and complete the table for the number of sticks in each pattern.</p> <table border="1" data-bbox="479 1528 1166 1654"> <tr> <td>Pattern No.</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>Number of sticks</td> <td>8</td> <td>15</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Engage learners to study the pattern of numbers below and complete table.</p> <table border="1" data-bbox="479 1768 1166 1860"> <tr> <td>Domain</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>Co-domain</td> <td>4</td> <td>7</td> <td>10</td> <td></td> <td>16</td> <td></td> <td></td> </tr> </table>	Pattern No.	1	2	3	4	5	6	7	Number of sticks	8	15						Domain	1	2	3	4	5	6	7	Co-domain	4	7	10		16			<p>Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards</p>
Pattern No.	1	2	3	4	5	6	7																											
Number of sticks	8	15																																
Domain	1	2	3	4	5	6	7																											
Co-domain	4	7	10		16																													

Guide learners to find missing numbers in the co-domain?

Demonstrate to learners how to extend a given number relation.

i. If the next number in the domain is 9, what will be the corresponding number in the co-domain?



Assessment

Copy and complete the table for the number of sticks in each pattern.

Domain	1	2	3	4	5	6	7
Co-domain	4	7	10		16		

**PHASE 3:
REFLECTION**

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

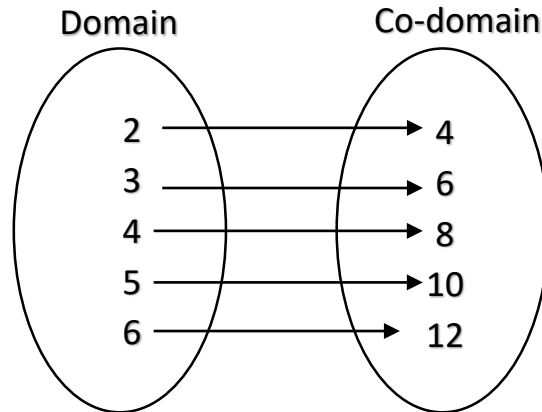
SECOND TERM WEEKLY LESSON NOTES

WEEK 4

Date: 3 RD JUNE, 2022	DAY :	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Patterns and Relations
Content Standard: B7.2.1.1 Derive the rule for a set of points of a relation, draw a table of values to graph the relation in a number plane and make predictions about subsequent elements of the relation.	Indicator: B7.2.1.1.2 Describe the rule for a given relation using mathematical language such as one more, one less, one more than twice, etc	Lesson: 2 of 3
Performance Indicator: Learners can describe the rule for a given relation		Core Competencies: Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 27-28		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: NEW LEARNING	Guide learners to describe given relations. <i>To get the rule for a given relation, first identify how each pattern differs from the other.</i> <i>For example, in the relation below, all the numbers in the domain are square root of the numbers in the co-domain. Or all the members in the co-domain are square of the numbers in the domain. Therefore, we can describe the rule for this relation as “$y = x^2$”.</i> Example: <div style="text-align: center;"> <p>Domain Co-domain</p> </div>	Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards
	<i>To get the rule for a given relation, first identify how each pattern differs from the other. For example, in the relation below, all the</i>	

numbers in the domain are half of the numbers in the co-domain. Or all the members in the co-domain are doubles of the numbers in the domain.

Therefore, we can describe the rule for this relation as “x is half of y” or “ $y = 2x$ ”.



The relation in the above is that the co-domain is a double of the domain.

Guide learners to describe the rule for a relation using mathematics language.

This table shows the pattern of cost of packed breakfast for workers on a field trip.

Number of workers	1	2	3	4	5	6	?
Cost of breakfast	3	6	9	12	15	18	120

- (i) Explain the pattern of how the cost of breakfast changes as more workers go on the trip (describe the rule);
- (ii) Use the pattern to determine how many workers went on the trip if the cost of breakfasts is GH¢120.

Engage learners to state the rules in words to represent a given relation.

Term/Input (x)	1	2	3	4	5	x	Rule for n in words
Result/Output A	5	10	15	20			$x \rightarrow 5$ times x
Result/Output B	0	4	8	12			$x \rightarrow 4$ times one less x
Result/Output C	4	7	10	13			$x \rightarrow 1$ more than thrice x
Result/Output D	2	6	8	10			$x \rightarrow$ twice 1 more than x
Result/Output E	5	11	17				$x \rightarrow$


Have learners practice with more examples.

**PHASE 3:
REFLECTION**

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

Date: 3 RD JUNE, 2022	DAY :	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Patterns and Relations
Content Standard: B7.2.1.1 Derive the rule for a set of points of a relation, draw a table of values to graph the relation in a number plane and make predictions about subsequent elements of the relation.	Indicator: B7.2.1.1.3 Identify the relation or rule in a pattern/mapping presented numerically or symbolically and predict subsequent elements	Lesson: 3 of 3
Performance Indicator: Learners can identify the relation or rule in a pattern	Core Competencies: Critical Thinking and Problem solving (CP)	
References: Mathematics Curriculum Pg. 30-31		

Phase/Duration	Learners Activities	Resources																																																																					
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>																																																																						
PHASE 2: NEW LEARNING	<p>Guide learners to determine the rule for a given symbolic pattern.</p>  <table border="1" data-bbox="477 1146 1166 1285"> <tr> <td>Shape number</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>No. of matchsticks</td> <td>3</td> <td>5</td> <td>7</td> <td>9</td> <td>11</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Rule for the pattern</td> <td colspan="9">Number of matchsticks = shape number x</td> </tr> </table> <p>Guide learners to determine the rule for a given numerical pattern.</p> <table data-bbox="500 1394 1133 1577"> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td></td> <td>0</td> <td>3</td> <td>6</td> <td>9</td> <td>12</td> <td>15</td> </tr> <tr> <td></td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td></td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> <td>↓</td> </tr> <tr> <td>y</td> <td>0</td> <td>1</td> <td>4</td> <td>9</td> <td>16</td> <td></td> <td>-1</td> <td>5</td> <td>11</td> <td>17</td> <td>23</td> <td>n</td> </tr> </table> <p>We can find the rule for the pattern by using either;</p> <ol style="list-style-type: none"> The method of inspection. Each number is mapped onto the square of itself. Therefore if x stands for any element, then the rule for the pattern is $y = x^2$ The method of difference If it is obvious by inspection how to find the rule, the method of difference may be used. Find the difference 	Shape number	1	2	3	4	5	6	7	8	9	No. of matchsticks	3	5	7	9	11					Rule for the pattern	Number of matchsticks = shape number x									x	0	1	2	3	4		0	3	6	9	12	15		↓	↓	↓	↓	↓		↓	↓	↓	↓	↓	↓	y	0	1	4	9	16		-1	5	11	17	23	n	Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards
Shape number	1	2	3	4	5	6	7	8	9																																																														
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Rule for the pattern	Number of matchsticks = shape number x																																																																						
x	0	1	2	3	4		0	3	6	9	12	15																																																											
	↓	↓	↓	↓	↓		↓	↓	↓	↓	↓	↓																																																											
y	0	1	4	9	16		-1	5	11	17	23	n																																																											

between elements in the co-domain and domain. If the 1st difference are the same then we use the formula $y = ax + b$

$$a = \frac{\text{constant difference of co-domain}}{\text{constant difference of domain}}$$

domain = 0 3 6 9 12 co-domain = -1 5 11 17

$\begin{array}{cccc} \diagdown & \diagup & \diagdown & \diagup \\ 3 & 3 & 3 & 3 \end{array}$

 $\begin{array}{ccc} \diagdown & \diagup & \diagdown \\ 6 & 6 & 6 \end{array}$

therefore $a = \frac{6}{3} = 2$

Now we find b, which is a constant to be determined using $x = 3$ and $y = 5$.

$$\begin{aligned} y &= ax + b \\ 5 &= 2(3) + b \\ b &= 5 - 6 \\ b &= -1 \end{aligned}$$

therefore the rule is $y = 2x - 1$

Have learners practice with more examples in their workbooks.

Assessment

1. Find the rule for the following patterns

$$\begin{array}{cccccc} 0 & 1 & 2 & 3 & 4 & 5 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 2 & 5 & 8 & 11 & 14 & 17 \end{array}$$

$$\begin{array}{cccccc} 0 & 3 & 6 & 9 & 12 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ -1 & 5 & 11 & 17 & 23 \end{array}$$

$$\begin{array}{cccccc} 0 & 1 & 2 & 3 & 4 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 2 & 4 & 6 & 8 & 10 \end{array}$$

PHASE 3:
REFLECTION

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

SECOND TERM WEEKLY LESSON NOTES

WEEK 5

Date: 10 th JUNE, 2022	Period:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Algebraic Expressions
Content Standard: B7.2.2.1 Simplify algebraic expressions involving the four basic operations and substituting values to evaluate algebraic expressions.	Indicator: B7.2.2.1.1 Create simple algebraic expressions using simple logic to translate a set of instructions into an algebraic expression.	Lesson: 1 of 2
Performance Indicator: Learners can identify the unknown in a problem; represent the problem with an equation; and solve the problem concretely		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 35-36		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Using questions and answers, review to find out what learners already know about Algebraic Expressions. Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Brainstorm learners for the meaning of Algebra Algebra is a way to work out problems with unknown values. Look at this question $5 + ? = 8$ We already know the answer, but only know one part of the question, the other is unknown. We are already used to “blank boxes” and “dashes” for representing the unknown number. But in Algebra, it is replaced with a variable such as (a, b, c, x, y etc.) Hence this how the question will be written $5 + a = 8$ We call this an Equation. Equation is a mathematical question which involves two parts with an equal sign in between. Let’s see how we can solve problems using Algebra. E.g. <i>A farmer cultivates apples on a large scale of land. He plucks them when they ripped for sale.</i> <i>On a particular tree, he plucked 15 ripped apples and 8 apples were left on the tree. So how many apples were there on the tree?</i>	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	<p>Let's use the letter "a" to represent the total number of apples on the tree. Thus $a - 15 = 8$</p> <p>$(a-15)$ is on one side of the equal sign and the other side 8 as the answer. To work out for "a", we need to isolate "a", so that is on its own.</p> <p>Have learners to get rid of the (-15). So we add the inverse of (-15), that is $(+15)$ to both side of the equation.</p> $a-15+15=8+15$ $a-\cancel{15}+\cancel{15}=8+15$ $a=8+15$ $a= 23$ <p>Have learners to conclude that the total number of apples on the tree was 23. So if the farmer pluck 15, it will be left with 8.</p> <p>Guide learners to solve for x in simple equations e.g. $x + 3 = 6$ $x + 1+5 = 7$</p> <p>Assessment: Give similar problems for learners to write the mathematical equation statements of the problem</p>	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

Date: 10 th JUNE, 2022	Period:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Algebraic Expressions
Content Standard: B7.2.2.1 Simplify algebraic expressions involving the four basic operations and substituting values to evaluate algebraic expressions.	Indicator: B7.2.2.1.1 Create simple algebraic expressions using simple logic to translate a set of instructions into an algebraic expression.	Lesson: 1 of 2
Performance Indicator: Learners can create a problem for a given equation		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 35-36		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to create word problems for equations. e.g. Jenny has 7 marbles and ken has 5. How many do they have together?</p> <p>The quantities here are Jenny's marbles, ken's marbles and total marbles. The relationship between the three is</p> <p>Jenny's Marbles + Ken's Marbles = Total Marbles</p> $7 + 5 = \underline{\quad}$ <p>Let learners solve several examples.</p> <p>Let learners now consider this problem; e.g. Jenny and Ken together have 37 marbles, and ken has 15. How many does jenny have?</p> <p>The relationship between the quantities is the same as the above.</p> <p>Jenny's Marbles + Ken's Marbles = Total Marbles</p> $\underline{\quad} + 15 = 37$ <p>The problem requires we find Jenny's marbles which we don't know. So we represent Jenny's marbles as "a"</p> $a + 15 = 37$ <p>Guide learners to solve the equation</p>	<p>Counters, bundle and loose straws base ten cut square, Bundle of sticks</p>

Introduce learners to more complex word problems. Consider this example.:

Example: *Peny, Keny And Peny together have 51 marbles. Keny has double as many marbles as Jenny has, and Peny has 12. How many does Jenny have?*

The relationship between the quantities is the same as the above. However we need to denote the number of Jeny's and Keny's marbles with something. Jenny's marbles are unknown, so we can denote that with the variable "n". then Keny has 2n marbles.

$$\begin{array}{r} \text{Jenny's} \quad \text{Ken's} \quad \text{Peny's} \quad = \quad \text{Total} \\ \text{Marbles} \quad \text{Marbles} \quad \text{marbles} \quad \text{Marbles} \\ n \quad + \quad 2n \quad + \quad 12 \quad = \quad 51 \end{array}$$

Guide learners to solve the equation.

Ask learners to describe stories that the equation $14 - x = 9$ could represent.

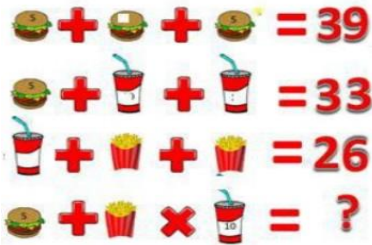
That is: henry has 14 oranges in his bag. He gave some of the oranges to his friends. He now has 9 oranges left. How many oranges did he give to his friends?

Let learners describe stories to represent the following equations.

- a. $1+15=9+x$
- b. $8+x=3+12$
- c. $4+5=11-x$
- d. $3+x=13-2$

Assessment

Solve the puzzle



**PHASE 3:
REFLECTION**

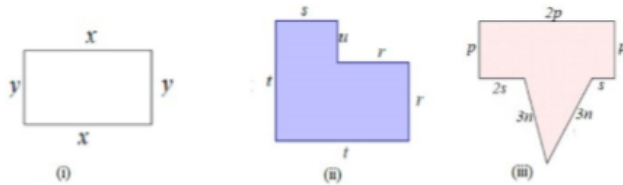
Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

SECOND TERM WEEKLY LESSON NOTES

WEEK 6

Date: 17 th JUNE, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Algebraic Expressions
Content Standard: B7.2.2.1 Simplify algebraic expressions involving the four basic operations and substituting values to evaluate algebraic expressions.	Indicator: B7.2.2.1.2 Perform addition and subtraction of algebraic expressions with rational coefficients.	Lesson: 1 of 2
Performance Indicator: Learners can perform addition and subtraction of algebraic expressions		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 36-37		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Using questions and answers, review to find out what learners already know about Algebraic Expressions. Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Guide learners to add algebraic expressions. Let learners understand that, only like terms can be added or subtracted to give a single term. Example: 1). $4x + 3x + x = 8x$ 2). $5x + 4x + 2x + 3x = 14x$ 3). $s + s + s + t + t + k + k + k$ $= 3s + 2t + 3k$ Engage learners to practice with more examples. Go round the class and provide assistance to the slow learners. Perform activities like “think of a number” game with pupils E.g. <i>think of a number, add 2 to it and multiply the sum by 3.</i> $= (x + 2) \times 3 = 3x + 6$ <i>Think of another number, multiply it by 2, add 4 to the result</i> i.e. $(y - 2) + 4 = 2y + 4$ Add the results; $(3x + 6) + (2y + 4) = 3x + 2y + 10$ Write an expression for the perimeter of the following shapes	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles



(i) perimeter = $l + l + b + b$
 $= x + x + y + y$
 $= 2x + 2y$

Engage learners to practice with more examples. Go round the class and provide assistance to the slow learners.

Guide learners to subtract algebraic expressions.

Example: $3x - 4x - 2x = -3x$

$7x - 4x - x = 2x$

Guide learners to add and subtract algebraic expressions.

Example: $5x + 4 - 9y + 3x + 2y - 7$

We first group like terms taking notice of the operation signs.

$= 5x + 3x - 9y + 2y + 4 - 7$

$= 8x - 7y - 3$

E.g.2. $7xy + 5x - 4x + 2xy - 3$

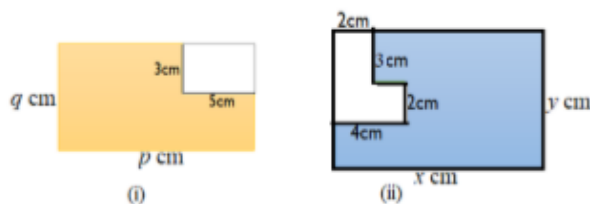
We first group like terms taking notice of the operation signs.

$= 7xy + 2xy + 5x - 4x - 3$

$= 9xy + x - 3$

Engage learners to practice with more examples. Go round the class and provide assistance to the slow learners.

Learners to write an expression for the perimeter of the shaded region.



Assessment

Simplify the following expressions




1. $5x + 4 - 9y + 3x + 2y - 7$

2. $4x + 2y + 3x + 5y$

3. $2p - 3q + 3p + 5q$

	4. $4x^2y + 5xy^2 + 3x^2y - 2xy^2$ 5. $x^2 + x + 2x^2$	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Date: 17 th JUNE, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Algebraic Expressions
Content Standard: B7.2.2.1 Simplify algebraic expressions involving the four basic operations and substituting values to evaluate algebraic expressions.	Indicator: B7.2.2.1.3 Perform multiplication and division of algebraic expressions with rational coefficients.	Lesson: 2 of 2
Performance Indicator: Learners can perform multiplication and division of algebraic expressions		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 38-39		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to solve multiplication of algebraic expressions. <i>It is easier to group the numbers and the same letters together and then use the basic rules of indices.</i> Example: $4p \times 8p^2$ $= 4 \times 8 \times (p^{1+2})$ $= 32p^3$</p> <p>E.g.2. $5xy^2 \times 4x^4y^3 = 20x^5y^5$</p> <p>Guide pupils to perform activities like “think of a number” game which involves multiplying algebraic expressions.</p> <p>Guide learners to write an expression for the area of the following shapes:</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>(i)</p> </div> <div style="text-align: center;">  <p>(ii)</p> </div> <div style="text-align: center;">  <p>(iii)</p> </div> </div> <p>Guide learners to solve division of algebraic expressions. Example: Simplify the following expression:</p> $1. \frac{12x^3y^2}{16xy^4}$ $= \frac{12}{16} \times (x^{3-1})(y^{2-4})$	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

	$= \frac{3}{4} \times (x^2)(y^2) = \frac{3}{4} x^2y^2$ <p>E.g. II. $\frac{-30abc}{6ab^3c^{-2}}$</p> $= \frac{-30}{6} * (a^{-1})(b^{1-3})(c^{-1-3})$ $= -5 * (b^{-2})(c^{-4}) = -5b^{-2}c^{-4}$ <p><u>Assessment</u> Simplify the following expression:</p> <ol style="list-style-type: none"> 1. $5p \times 7p^2$ 2. $6xy^3 \times 4x^5y^6$ 3. $-2b \times 5a \times 9c$ 4. $-3xy^5 \times 7y$ 5. $\frac{18x^5y^2}{24x^7y^2}$ 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

SECOND TERM WEEKLY LESSON NOTES

WEEK 7

Date: 24 th JUNE, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Algebraic Expressions
Content Standard: B7.2.2.1 Simplify algebraic expressions involving the four basic operations and substituting values to evaluate algebraic expressions.	Indicator: B7.2.2.1.4 Substitute values to evaluate algebraic expressions.	Lesson: 1 of 2
Performance Indicator: Learners can substitute values to evaluate algebraic expressions		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 39-40		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Using questions and answers, review to find out what learners already know about Algebraic Expressions. Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Guide learners to substitute values to evaluate algebraic expressions.. Let learners note the following rules when substituting values. <i>ab means the product of a and b. That is $a \times b$.</i> <i>2a means the product of the quantities 2 and a. That is $2 \times a$.</i> <i>a^2 means the square of a. That is $a \times a$.</i> <i>3a means the product of the quantities 3 and a. that is $3 \times a$.</i> <i>a^3 means the third power of a. that is $a \times a \times a$.</i> <i>- d means $-1 \times d$ or $-1d$.</i> <i>$3ab^2$ means $3 \times a \times b^2$ or $3 \times a \times b \times b$.</i> Example: Simplify the following expressions and substitute the values to evaluate them, if $x = 2, y = 4, p = 3$ and $z = -1$, I. $3xy \times 5y$ $= (3 \times 2 \times 4) \times (5 \times 4)$ $= 24 \times 20$ $= 480$ II. $7xy + 5x - 4x + 2xy - 3$ $= (7 \times 2 \times 4) + (5 \times 2) - (4 \times 2) + (2 \times 2 \times 4) - 3$ $= 56 + 10 - 8 + 16 - 3$ $= 71$	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

Have learners practice with more examples.

Guide learners to simplify the following expressions and substitute the values to evaluate them, if $x = 2$, $y = 4$, $a = 3$, $b = 2$, $z = 1$ and $c = -1$,

i. $\frac{8xyz}{16xy}$

to solve this, we first simplify the expression.

$$\frac{8xyz}{16xy} = \frac{1}{2} * (x - x) * (y - y) * z$$

Now substitute the values

$$= \frac{1}{2} * z = \frac{1}{2} * 1 = \frac{1}{2}$$

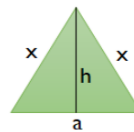
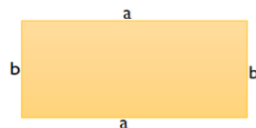
Let learners practice with more examples.

Assessment

Simplify the following expressions and substitute the values to evaluate them,

If $x = 2$, $y = 4$, $p = 4$ and $z = -1$

1. $4p \times 8z^2$
2. $5x + 4 - 9y + 3x + 2y - 7$
3. $7xy + 5x - 4x + 2xy - 3$
4. $\frac{18xp^3}{24xz}$
5. $\frac{12x^3y^2}{16xy^4}$
6. $\frac{-30abp}{6ab^3c^2}$
7. If $x = 5$, $a = 8$, $b = 3$, $h = 6$, find the perimeter and area of the following shapes.



PHASE 3: REFLECTION

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

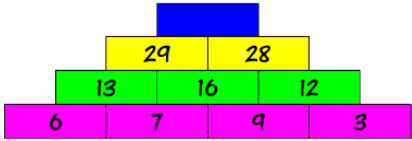
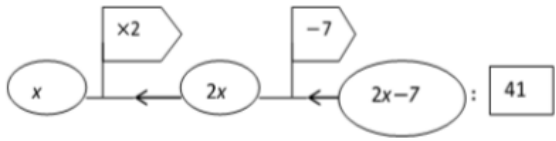
Date: 24 th JUNE, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Algebraic Expressions
Content Standard: B7.2.2.1 Simplify algebraic expressions involving the four basic operations and substituting values to evaluate algebraic expressions.	Indicator: B7.2.2.1.5 Use properties of the four operations to simplify algebraic expressions with rational coefficients	Lesson: 2 of 2
Performance Indicator: Learners can simplify algebraic expressions using properties of the four operations.		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 39-40		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to simplify algebraic expressions involving the four operations. When working problems involving algebraic expressions which have more than one of the following signs; 'of', x, +, - and ÷. The following steps should be taken. <i>Deal with anything in Brackets first. i.e. '()'</i> <i>Deal with 'of' if there is any. i.e. of = x</i> <i>Deal with any division if there is any. i.e. '÷'.</i> <i>Deal with any multiplication. i.e. 'x'</i> <i>Deal with any addition if there is any. i.e. '+'.</i> <i>Deal with any subtraction if there is any. i.e. '-'.</i></p> <p>Example: i. $3xy \times 2 + \frac{6x^2y^3}{2y^2}$</p> <p><i>Since there is no bracket, we move to the next operation sign. So we put the two factors into brackets since they are multiplying. i.e. 3xy and 2</i></p> $= (3xy \times 2) + \frac{6x^2y^3}{2y^2}$ $= 6xy + \frac{6x^2y^3}{2y^2}$ $= 6xy + 3x^2$ <p>ii. $3x^2y + 2xy^2 - 4x^2y - 6xy^2$ we begin by grouping like terms. $= 3x^2y - 4x^2y + 2xy^2 - 6xy^2$ $= -x^2y - 4xy^2$</p> <p>iii. $(15p^3q^2 \times 12x^5y^3) \div (36pq \times 45xy)$ we begin by solving what is in the brackets.</p>	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

	$= (180 p^3 q^2 x^5 y^3) \div (1620 p q x y)$ <p>We then write it in fraction</p> $= \frac{180 p^3 q^2 x^5 y^3}{1620 p q x y}$ $= 9 p^2 q x^4 y^2$ <p>Guide learners to practice with more examples.</p> <p><u>Assessment</u></p> <ol style="list-style-type: none"> 1. $8xyz \div 16xy \times 2$ 2. $5ab^2 \times 3a^2b \div ab$ 3. $4x + 7 - 2x + 4 \times 7x$ 4. $(h + 7) - (h - 8)$ 5. $(e + f + g) - (e - f + g)$ 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

SECOND TERM WEEKLY LESSON NOTES

WEEK 8

Date: 1 st JULY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Variables and Equations
Content Standard: B7.2.3.1 Demonstrate an understanding of linear equations of the form $x + a = b$ (where a and b are integers) by modelling problems as a linear equation and solving the problems concretely, pictorially, and symbolically..		Indicator: B7.2.3.1.1 Translate word problems to linear equations in one variable and vice versa.
Performance Indicator: Learners can translate word problems to linear equations in one variable and vice versa		Lesson: 1 of 2
Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)		
References: Mathematics Curriculum Pg. 40-42		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Can you work out what number will be at the top of the pyramid?</p>  <p>Write on the board: $x + 7 = 15$</p> <p>Ask learners;</p> <ol style="list-style-type: none"> to identify the unknown variable. (Answer: x) What is the value of x? <p>Give some minutes to solve the problem and share their answers with the class.</p> <p>Share learning indicators and introduce the lesson.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to use a flag diagram for equations and their inverses to solve equations.</p> <ol style="list-style-type: none"> Think of a number, double it and subtract 7. The result is 41. What was the original number? The flag diagram is:  <p>i.e. $2x - 7 = 41$</p>	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

To solve the equation, move in the opposite direction and do the inverse of the operations.



Guide learners to translate word problems to linear equations.

i. The sum of the ages of two friends is 25, and the older one is 4 times that of the younger one. Write this as a mathematical sentence?

i.e. let the age of the younger one be x \therefore the age of older one = $4x$

$$4x + x = 25$$

ii. Adaako and Afrakoma shared 40 oranges. Afrakoma had 6 more than Adaako. Write a mathematical sentence for this word problem.

i.e. let x represent Adaako's share. \therefore Afrakoma's share is $x+6$ and their share put together gives 40.

$$\therefore x+(6+x)=40$$

Have learners write word problems for given linear equations

i. $x + x = 15$

i.e. the sum of two equal numbers is 15

ii. $2x - 4 = 12$

i.e. when 4 is taken away from 2times a certain number, the result is 12.

iii. $\frac{2}{3}x = 4$

i.e. two-thirds of a certain number is 4.

Assessment

Ask students to describe two different stories that the equation $5 + k = 9$ could represent.

First story: A book has 9 pages. Niko has 5 pages left to read. How many pages has he read?

Second story: The sum of a number k and 5 is equal to 9. What is the number?

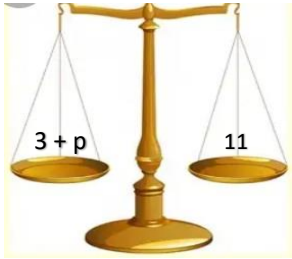
Give learners more equations for them make up more stories from them

PHASE 3: REFLECTION

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

Date: 1 st JULY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Variables and Equations
Content Standard: B7.2.3.1 Demonstrate an understanding of linear equations of the form $x + a = b$ (where a and b are integers) by modelling problems as a linear equation and solving the problems concretely, pictorially, and symbolically..		Indicator: B7.2.3.1.2 Model and solve linear equations using concrete materials
Performance Indicator: Learners can model and solve linear equations using concrete materials		Lesson: 2 of 2
Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)		
References: Mathematics Curriculum Pg. 40-42		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Using questions and answers, review to find out what learners already know about Algebraic Expressions. Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	<p>Guide learners use concrete materials, such as blocks or counters and the balance scales, to find the value of variables in equations.</p> <p>Let learners understand the rules involved in solving a linear equation by the balancing method.</p> <ul style="list-style-type: none"> • Add the same quantity to each side • Subtract the same quantity from each side. • Multiply each side by the same quantity • Divide each side by the same quantity <p>For example: $3 + p = 11$</p>  <p>With this example, we have to make both sides of the scale equal. i.e. $p + 3 - 3 = 11 - 3$ $p = 8$</p>	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

Guide learners to model and solve linear equations set with objects on a balance.



$$x + 3 = 7$$

$$x + 3 - 3 = 7 - 3$$

$$x = 4$$



$$5x + 1 = 3x + 5$$

$$5x - 3x + 1 = 3x - 3x + 5$$

$$2x + 1 = 5$$

$$2x + 1 - 1 = 5 - 1$$

$$2x = 4$$



$$3y + 4 = 2y + 8$$

$$3y - 2y + 4 = 2y - 2y + 8$$

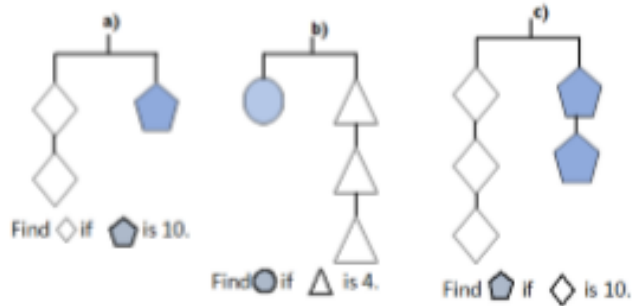
$$y + 4 = 8$$

$$y + 4 - 4 = 8 - 4$$

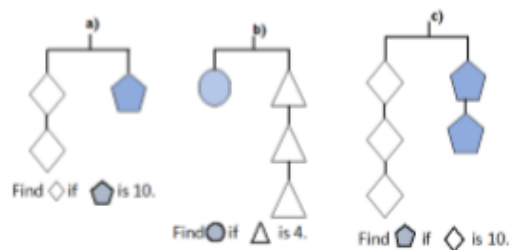
$$y = 4$$

Model and guide learners to solve linear equations set with shapes on a balance

i. In each balance the mass of one shape is given in grams. Find the mass of the other shape.



ii. In each balance the mass of one rhombus is 12 grams. Find the mass of the pentagon.



Assessment

Have learners to solve puzzle in the figure, by solving the equations in each line.

$$\begin{aligned} \bullet + \blacklozenge \times \triangle & \\ \bullet + \bullet + \bullet & = 60 \\ \bullet + \blacklozenge + \blacklozenge & = 40 \\ \blacklozenge + \triangle + \triangle & = 20 \end{aligned}$$

$$\begin{aligned} \text{Soft Drink} + \text{Soft Drink} + \text{Soft Drink} & = 30 \\ \text{Soft Drink} + \text{Burger} + \text{Burger} & = 20 \\ \text{Burger} + \text{Popcorn} + \text{Popcorn} & = 9 \\ \text{Burger} + \text{Popcorn} \times \text{Soft Drink} & = ? \end{aligned}$$

$$\begin{aligned} \text{Burger} + \text{Burger} + \text{Burger} & = 39 \\ \text{Burger} + \text{Soft Drink} + \text{Soft Drink} & = 33 \\ \text{Soft Drink} + \text{Popcorn} + \text{Popcorn} & = 26 \\ \text{Burger} + \text{Popcorn} \times \text{Soft Drink} & = ? \end{aligned}$$

PHASE 3:
REFLECTION

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

SECOND TERM WEEKLY LESSON NOTES

WEEK 9

Date: 8 th JULY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Variables and Equations
Content Standard: B7.2.3.1 Demonstrate an understanding of linear equations of the form $x + a = b$ (where a and b are integers) by modelling problems as a linear equation and solving the problems concretely, pictorially, and symbolically..		Indicator: B7.2.3.1.3 Model linear equations, then write mathematical expressions and describe the process of solving the equation using algebraic tiles.
Performance Indicator: Learners can solve linear equations in one variable at both sides of the equal sign.		Lesson: 1 of 2
Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)		
References: Mathematics Curriculum Pg. 40-42		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: NEW LEARNING	Guide learners to solve equations with the letter on both sides of the equal sign. If an equation contains variables on both sides of the equal sign, group all 'like terms' on one side. Example: i. $5x + 3 = 4x + 17$ (we group like terms) $5x - 4x = 17 - 3$ (simplify both sides) $x = 14$ ii. $6x - 2 = 4x - 1$ (grouping like terms) Sometimes it is easier to group them on the right hand side. $6x - 4x = -1 + 2$ (simplify both sides) $2x = 1$ (divide both sides by 2) $x = \frac{1}{2}$ Engage learners to practice with more examples. Have learners discuss the steps involved in solving equations containing brackets. Expand to remove brackets, whenever equations contains brackets. Let learners be mindful of negative numbers.	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

	<p>Example:</p> <p>i. $3(x-2) = x + 8$ (expand to remove brackets) $3x - 6 = x + 8$ (group like terms) $3x - x = 8 + 6$ (simplify both sides) $2x = 14$ (divide both sides by 2) $x = 7$</p> <p>ii. $2(a+1) = 14 + a$ (expand to remove brackets) $2a + 2 = 14 + a$ (group like terms) $2a - a = 14 - 2$ (simplify both sides) $a = 12$</p> <p>Engage learners to practice with more examples.</p> <p><u>Assessment</u></p> <ol style="list-style-type: none"> 1. $5x - 3 = 3x + 7$ 2. $8x + 1 = 2x + 5$ 3. $y + 18 = -6y - 3$ 4. $2x + 3 = 7 - 3x$ 5. $4 - 7x = 3x + 4$ 6. $2(x-1) = 3(x-6)$ 7. $3x - 5 = -1(x-3)$ 8. $2(p+9) = 3 - p$ 9. $4(3m - 7) = 9(m+3)$ 10. $16 = 12(a+5) + 5 - a$ 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

Date: 8 th JULY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Algebra
Class: B7	Class Size:	Sub Strand: Variables and Equations
Content Standard: B7.2.3.1 Demonstrate an understanding of linear equations of the form $x + a = b$ (where a and b are integers) by modelling problems as a linear equation and solving the problems concretely, pictorially, and symbolically..		Indicator: B7.2.3.1.4 Solve linear equations in containing fractions
Performance Indicator: Learners can solve linear equations in containing fractions		Lesson: 2 of 2
Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)		
References: Mathematics Curriculum Pg. 40-42		

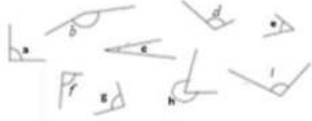
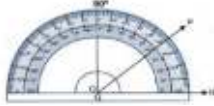

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Using questions and answers, review to find out what learners already know about Algebraic Expressions. Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Guide learners to solve learners to equations containing fractions. To solve equations containing fractions, we change the fractions to whole numbers by first multiplying each term of the equation by the LCM of the denominators, Example: i. $\frac{2x-1}{3} - \frac{x-2}{4} = 1$ (multiply through with the LCM of 12) $12 \times \frac{2x-1}{3} - 12 \times \frac{x-2}{4} = 1 \times 12$ $4(2x - 1) - 3(x - 2) = 12$ (expand to remove brackets) $8x - 4 - 3x + 6 = 12$ (group like terms) $8x - 3x = 12 - 6 + 4$ (simplify both sides) $5x = 10$ (divide both sides by 5) $x = 2$ ii. $\frac{x}{4} + \frac{3}{5} = \frac{3x}{2} - 2$ (multiply through with the LCM of 20) $20 \times \frac{x}{4} + 20 \times \frac{3}{5} = 20 \times \frac{3x}{2} - 20 \times 2$ $5x + 12 = 30x - 40$ (group like terms) $12 + 40 = 30x - 5x$ (simplify both sides) $52 = 25x$ (divide both sides by 25) $x = \frac{52}{25}$ iii. $\frac{7}{13} = \frac{x}{52}$ (cross multiply)	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

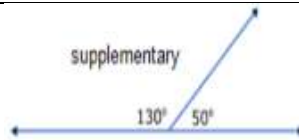
	$13x = 7 \times 52 \quad (\text{simplify both sides})$ $13x = 364 \quad (\text{divide both sides by } 13)$ $x = 28$ <p>Engage learners to practice with more examples.</p> <p><u>Assessment</u></p> <ol style="list-style-type: none"> 1. $\frac{2}{3}(3y - 1) - (y + 2) = \frac{1}{3}$ 2. $\frac{4x-3}{2} = \frac{8x-10}{8} + 2\frac{3}{4}$ 3. $\frac{3}{14}(x + 1) + 1 = \frac{1}{2}(x - 2) + 5$ 4. $\frac{1}{x} + \frac{1}{3} = 1$ 5. $2 = \frac{6}{x-2}$ 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

SECOND TERM WEEKLY LESSON NOTES

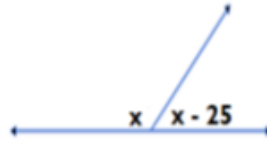
WEEK 10

Date: 15 th JULY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Geometry & Measurement
Class: B7	Class Size:	Sub Strand: Shape and Space
Content Standard: B7.3.1.1 Demonstrate understanding of angles including adjacent, vertically opposite, complementary, supplementary and use them to solve problems.	Indicator: B7.3.1.1.1-2 Measure and classify angles according to their measured sizes – right, acute, obtuse and reflex.	Lesson: 1 of 2
Performance Indicator: Learners can measure angles using the protractor. Learners can classify angles into right, acute, obtuse and reflex.		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 47-49		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to sort angles into those which are right, acute, obtuse or reflex angles from photocopied worksheets with several angles to measure.</p>  <p>Use a protractor to draw angles such as 30°, 45°, 60°, 75°, 90°, 120°, 150°, 270°, 300°, etc.</p>  <p>Guide learners to apply the fact that; (i) complementary angles are two angles that have a sum of 90°, and</p>  <p>(ii) supplementary angles are two angles that have a sum of 180° to solve problems.</p>	Empty chalk boxes, tins, cut out shapes from cards.

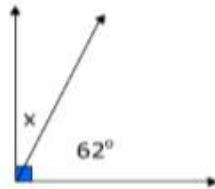


Guide learners to determine the angle(s) marked with letters in the complementary and supplementary angles.
 Example: determine the missing angle marked x.



Since complementary angles sum up to 180° ,
 $x + x - 25 = 180^\circ$ (group like terms)
 $x + x = 180 + 25$ (simplify both sides)
 $2x = 205$ (divide through by 2)
 $x = \frac{205}{2}$
 $x = 102.5^\circ$

E.g.2. determine the missing angle marked x.



Since complementary angles sum up to 90° ,
 $x + 62 = 90^\circ$ (group like terms)
 $x = 90 - 62$ (simplify both sides)
 $x = 28^\circ$

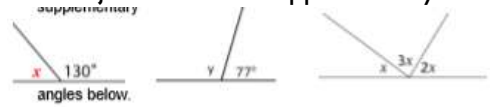
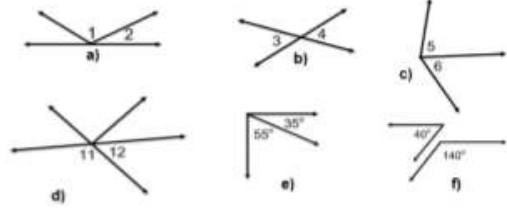
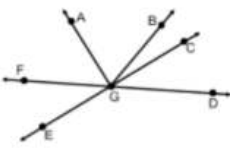
Engage learners to practice with more examples.

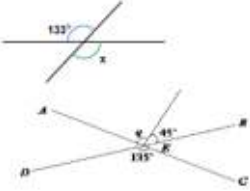
PHASE 3:
REFLECTION

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.


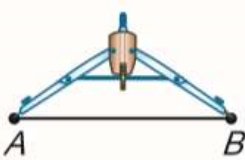
Date: 15 th JULY, 2022	DAY:	Subject: Mathematics
Duration:	Strand: Geometry & Measurement	
Class: B7	Class Size:	Sub Strand: Shape and Space
Content Standard: B7.3.1.1 Demonstrate understanding of angles including adjacent, vertically opposite, complementary, supplementary and use them to solve problems.	Indicator: B7.3.1.1.3 Use adjacent, supplementary and vertically opposite angles to solve problems	Lesson: 1 of 2
Performance Indicator: Learners can solve problems using adjacent, supplementary and vertically opposite angles	Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	
References: Mathematics Curriculum Pg. 47-49		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to determine the angle(s) marked with letters in the adjacent and/or supplementary.</p>  <p>Guide learners to identify each pair of angles as adjacent, vertically opposite, complementary or supplementary.</p>  <p>Use the figure at the right to identify and label the following angles</p> <ol style="list-style-type: none"> two acute vertical angles. two obtuse vertical angles. a pair of adjacent angles a pair of complementary angles. an angle supplementary to $\angle FGE$ 	Empty chalk boxes, tins, cut out shapes from cards.

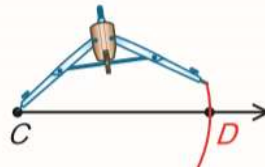
	<p>Guide learners to use adjacent, vertically opposite, complementary or supplementary to solve problems. Determine the angle(s) marked with letters</p> 	
<p>PHASE 3: REFLECTION</p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

SECOND TERM WEEKLY LESSON NOTES

WEEK 11

Date: 22 nd JULY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Geometry & Measurement
Class: B7	Class Size:	Sub Strand: Shape and Space
Content Standard: B7.3.1.2 Demonstrate how to construct a perpendicular to a line from a given point	Indicator: B7.3.1.2.1 Construct a line segment perpendicular to another line segment.	Lesson: 1 of 2
Performance Indicator: Learners can construct a line segment perpendicular to another line segment		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 51-52		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Show learners the pair of compasses and ask, what can we do with a pair of compasses?</p> <p>Allow learners to brainstorm.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Brainstorm learners to explain the following; <i>A construction is a geometric drawing that is made using only an unmarked straightedge and a compass.</i></p> <p><i>A compass is a geometric tool used to draw a circle or a part of a circle, called an arc.</i></p> <p>Guide learners to use a pair of compasses and a ruler to construct a copy of a given line segment. For instance: To construct a line segment, CD, congruent to a given line segment, AB:</p> <p>Step 1: Draw a ray with endpoint C.</p>  <p>Step 2: Open the compass to the length of \overline{AB}</p> 	Rule, pencil, a pair of compass, a pair of divider and protractor.

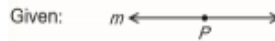
Step 3: With the same compass setting, put the compass point on C. Construct an arc that intersects the ray. Label the intersection D.



Let learners practice with more examples.

Guide learners to use a pair of compasses and ruler to construct a perpendicular at a point on a line segment, and drop a perpendicular from a given point outside a line segment.

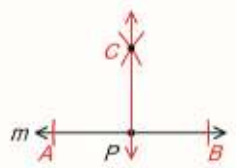
i. To construct a perpendicular to a given line, M , at a given point, P , on M :



Step 1: Place the compass tip on P . Construct arcs intersecting line m at the two points, A and B .

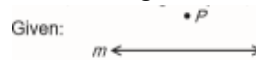
Step 2: Widen the compass to construct two intersecting arcs above point P , one with the center at A and one with the center at B . Label the intersection C .

Step 3: Draw \overline{CP} .



Guide learners to construct a perpendicular from a given point outside a line segment.

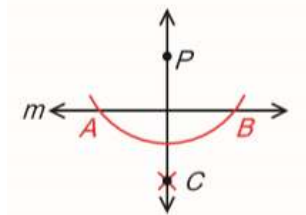
ii. To construct a perpendicular to a given line, m : from a given point, P , not on m .



Step 1: Place the compass tip on P . Construct arcs intersecting line m at the two points, A and B .

Step 2: Using the same compass setting, construct two intersecting arcs, one with the center at A and another with the center at B . Label the intersection C .

Step 3: Draw \overline{CP} .

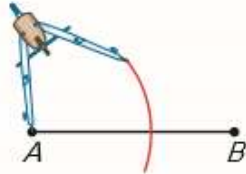
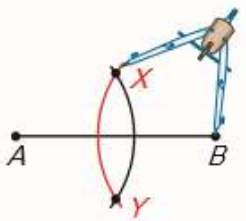
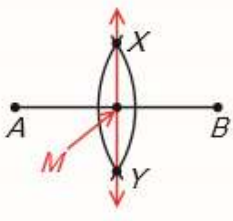


Assessment

Engage learners to practice with several examples.

PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	
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Date: 22 nd JULY, 2022	DAY:	Subject: Mathematics
Duration:	Strand: Geometry & Measurement	
Class: B7	Class Size:	Sub Strand: Shape and Space
Content Standard: B7.3.1.2 Demonstrate how to construct a perpendicular to a line from a given point, bisect a line, bisect angles, and construct angles of the following sizes: 30°, 45°, 60°, 75° and 90°	Indicator: B7.3.1.2.2: Construct the perpendicular bisector of a line segment	Lesson: 2 of 2
Performance Indicator: Learners can construct the perpendicular bisector of a line segment	Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	
References: Mathematics Curriculum Pg. 51-52		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to use a pair of compasses and a ruler to construct a perpendicular bisector of a given line segment.</p> <p>To construct a perpendicular at a point on a line segment</p> <p><i>Step 1: Put the compass point on point A and construct an arc. Be sure the opening is greater than half \overline{AB}</i></p>  <p><i>Step 2: Put the compass point on point B and construct an arc. Label the points where the two arcs intersect as X and Y.</i></p>  <p><i>Step 3: Draw \overline{XY}. Label the intersection of \overline{AB} and \overline{XY} as point M. \overline{XY} is a perpendicular bisector of \overline{AB}. Point M is the midpoint of \overline{AB}</i></p>  <p>Assessment</p> <ol style="list-style-type: none"> I. Draw and bisect the following lines <ol style="list-style-type: none"> a. $\overline{AB} = 8\text{cm}$ b. $\overline{AB} = 5.5\text{cm}$ 	<p>Rule, pencil , a pair of compass, a pair of divider and protractor.</p>

PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	
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SECOND TERM WEEKLY LESSON NOTES

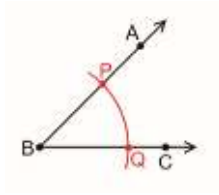
WEEK 12

Date: 29 TH JULY, 2022	DAY:	Subject: Mathematics
Duration:	Strand: Geometry & Measurement	
Class: B7	Class Size:	Sub Strand: Shape and Space
Content Standard: B7.3.1.2 Demonstrate how to construct a perpendicular to a line from a given point	Indicator: B7.3.1.2.3: Copy and bisect angles	Lesson: 1 of 2
Performance Indicator: Learners can copy and bisect angles	Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	
References: Mathematics Curriculum Pg. 51-52		

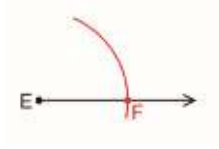
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to use a pair of compasses and a ruler to copy a given angle A.</p> <p>Steps: Draw a line and locate point B; copy the arc ST and transfer using B as center to obtain VW, join B and W to obtain the copied angle.</p>	<p>Rule, pencil , a pair of compass, a pair of divider and protractor.</p>

Guide learners to construct an angle $\angle DEF$ congruent to angle ABC

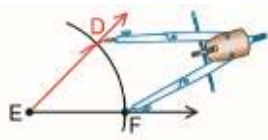
Step 1: put the compass point on B. construct an arc that intersects both rays of the angle at P and Q.



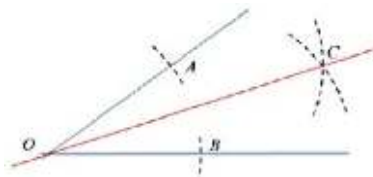
Step 2: use a straightedge to draw a ray with endpoint E. with the compass point on E, and the same compass opening as in step 1, construct an arc that intersects the ray at F.



Step 3: open the compass to measure the length PQ. With the same compass opening and the compass point on F., construct an arc that intersects the other arc at D. draw ED



Guide learners to perform geometric construction to bisect a given angle.



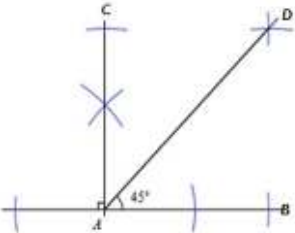
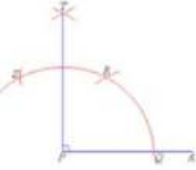
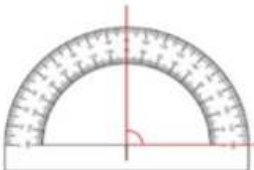
- (i) Sketch any acute angle and label it $AAAACC$.
- (ii) Copy the angle, measure and record its value.
- (iii) Sketch any angle and ask a colleague to copy the angle.

**PHASE 3:
REFLECTION**

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

Date: 29 th JULY, 2022	DAY:	Subject: Mathematics
Duration:		Strand: Geometry & Measurement
Class: B7	Class Size:	Sub Strand: Shape and Space
Content Standard: B7.3.1.2 Demonstrate how bisect a line, bisect angles, and construct angles of the following sizes: 30°, 45°, 60°, 75° and 90°	Indicator: B7.3.1.2.4: Construct angles of 90° and 45°	Lesson: 2 of 2
Performance Indicator: Learners can construct angles of 90° and 45°		Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 51-52		

Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	<p>Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions.</p> <p>Introduce the lesson by sharing performance indicators.</p>	
PHASE 2: NEW LEARNING	<p>Guide learners to use a pair of compasses and a ruler to construct an angle of 90°. Raise a perpendicular at a point) on a given line segment and verify using the protractor. (The line segment PT is perpendicular to PA therefore $\angle APT = 90^\circ$)</p>    <p>Have learners construct an angle of 45° by bisecting an angle of 90°.</p> <p><u>Assessment</u></p> <ol style="list-style-type: none"> I. Construct $\angle ABC = 45^\circ$ such that $AB = 5\text{cm}$ and $BC = 6\text{cm}$. bisect $\angle ABC = 45^\circ$ II. Construct $\angle ABC = 90^\circ$ and bisect it. 	<p>Rule, pencil , a pair of compass, a pair of divider and protractor.</p>

PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	
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