LESSON PLANS FOR JUNIOR HIGH SCHOOLS

MATHEMATICS

BASIC 7

TERM 1

- Weekly forecast
- Detailed lesson plans

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FIRST TERM MATHEMATICS LESSON NOTES – BASIC 7

SCHEME OF LEARNING – TERM 1

WEEKS	STRAND	SUB STRAND	INDICATORS	RESOURCES
1	Number	Numeration Systems	B7.1.1.1.1-2	Counters, bundle and loose straws base ten cut square, Bundle of sticks
2	Number	Numeration Systems	B7.1.1.1.3-4 B7.1.1.1.5 B7.1.2.1.1	
3	Number	Ratios and Proportion	B7.1.4.1.1-2 B7.1.4.1.3-4	Counters, bundle and loose straws base ten cut square, Bundle of sticks
4	Algebra	Patterns and Relations	B7.2.1.1.2-3	Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards
5	Geometry & Measurement	Patterns and Relations	B7.2.1.1.4 B7.2.2.1.1	Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards
6	Geometry & Measurement	Shape and Space	B7.3.1.1.1-3	Empty chalk boxes, tins, cut out shapes from cards.
7	Geometry & Measurement	Shape and Space	B7.3.1.2.1-2	Empty chalk boxes, tins, cut out shapes from cards.
8	Geometry & Measurement	Shape and Space	B7.3.1.2.3-4	
9	Handling Data	Data	B7.4.1.1.1-2	Class Registers, School Based Assessment, Graph books, flash cards Graph books, flash cards
10	Handling Data	Data	B7.4.1.1.3 B7.4.1.2.1	
11	Handling Data	Data	B7.4.1.2.2 B7.4.2.1.1	
12	**REVISION**			

WEEK 1

Week Ending:	**Period:**	**Subject:** Mathematics	
Duration:		**Strand:** Number	
Class: B7	**Class Size:**	**Sub Strand:** Numeration Systems	
Content Standard: B7.1.1.1 Demonstrate understanding and the use of place value for expressing quantities recorded as base ten numerals as well as rounding to a given decimal place and significant figures.	**Indicator:** B7.1.1.1.1 Model number quantities more than 1,000,000,000	**Lesson:** 1 of 5	
Performance Indicator: Learners can use names to count numbers up to 1,000,000,000		**Core Competencies:** CP, CC	
References: Mathematics Curriculum Pg.2			
Keywords: denomination, combination			

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Recap with learners to count forward and backwards, read and write number names of number quantities and vice versa, addition and subtraction of numbers. Share with learners the performance indicators.	
PHASE 2: **NEW LEARNING**	Guide learners to form numbers with given multi-base ten materials, given that a small cube is 1,000; 10 small cubes is a rod (i.e. 10,000), 10 rods is a flat (i.e. 100,000); and 10 flats is a block (i.e. 1000,000) Learners to use multiples of 10s, 50s, 100s and 200s to represent numbers in multiples of ways E.g. 5,560 = 20×200 + 10×100 +11×50 + 1×10; or 5,560 = 15×200 + 20×100 +10×50 + 6×10; etc. Let learners use tokens (or paper-made currency notes) such as GH₵20, GH₵50, GH₵100 and GH₵200 to work out how many of each denomination would be required to model given amount up to one billion. i. *Workout how many GH₵200 will make GH₵185, 000,000, GH₵1,890,750,000, etc.* ii. *Determine combinations of GH₵50, GH₵100 or GH₵200 notes that make GH₵1,000,000 (make sure each denomination is used* <u>Assessment</u>	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	1. Model the following numbers with multi-base ten materials or graph sheet: a. 150,000 b. 485,000 2. Write these numbers using words a) 3,500 b) 17,100 c) 54,400	
PHASE 3: **REFLECTOIN**	Engage learners to summarize the lesson outcomes. Ask learners how the lesson will benefit them in their daily lives.	

Week Ending:	**Period:**	**Subject:** Mathematics
Duration:		**Strand:** Number
Class: B7	**Class Size:**	**Sub Strand:** Numeration Systems

Content Standard:	**Indicator:**	**Lesson:**
B7.1.1.1 Demonstrate understanding and the use of place value for expressing quantities recorded as base ten numerals as well as rounding to a given decimal place and significant figures.	B7.1.1.2 Compare and order whole numbers more than 1,000,000,000 and represent the comparison using ">, <, or="	2 of 5

Performance Indicator:	**Core Competencies:**
Learners can use <, > and = to compare numbers up to 1,000,000,000	CP, CC

References: Mathematics Curriculum Pg.2

Keywords:

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Recap with learners to count forward and backwards, read and write number names of number quantities and vice versa, addition and subtraction of numbers. Share with learners the performance indicators.	
PHASE 2: **NEW LEARNING**	Skip count forwards and backwards in 25s, 50s and 250s beginning from 1000. Identify numbers which are for instance, 500,000 more than or less than a given 8-digit or 9-digit number. i. 1,295,800,000 is 500,000 more than 1,295,300,000 and 1,295,300,000 is 500,000 less than 1,295,800,000 Use phrases such as "is equal to", "is greater than" and "is less than' as well as their symbols such as ">", "<" and "=" to compare any two numbers. i 1,300,850,700 …. 1,300,850,700 ii. 5,223,487,637 …. 5,113,487,637 etc. <u>Assessment</u> 1. Compare the following numbers using < or >: a) 345 and 395 b) 4,726 and 9,726 c) 57,821 and 52,821 d) 209,481 and 279,481 d) 63,237 and 23,237 e) 368,7693 and 9,687,693	Counters, bundle and loose straws base ten cut square, Bundle of sticks

PHASE 3: **REFLECTOIN**	Engage learners to summarize the lesson outcomes. Ask learners how the lesson will benefit them in their daily lives.	

WEEK 2

Week Ending:	**Period:**	**Subject:** Mathematics
Duration:		**Strand:** Number
Class: B7	**Class Size:**	**Sub Strand:** Numeration Systems

Content Standard:	**Indicator:**	**Lesson:**
B7.1.1.1 Demonstrate understanding and the use of place value for expressing quantities recorded as base ten numerals as well as rounding to a given decimal place and significant figures.	B7.1.1.1.3 Round (off, up, down) whole numbers more than 1,000,000,000 to the nearest hundred-thousand, ten-thousands, thousands, hundreds and tens	3 of 5

Performance Indicator:	**Core Competencies:**
Learners can round (off, up, down) whole numbers	CP, CC

References: Mathematics Curriculum Pg.2

Keywords: round up" and "round down

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Recap with learners to find out what they already know about rounding off and significant figures. Share with learners the performance indicators.	
PHASE 2: **NEW LEARNING**	Guide learners to round off whole numbers up to over 1,000,000,000 to the nearest hundred-thousands, ten-thousands, thousands, hundreds, etc. For example, 1,879,653 to the nearest i. hundred thousand is 1,900,000 since 1,879,653 is nearer to 1,900,000 than 1 ,800,000 ii. ten thousand is 1,880,000 since 1,879,653 is nearer to 1,880,000 than 1,870,000. Guide learners to explain the differences between the "round up" and "round down" concepts. When rounding up, we consider the larger number, while when rounding down, we consider the smaller of the two. The table below may bring out the meaning of the concept.	Counters, bundle and loose straws base ten cut square, Bundle of sticks

2,846,655	Round up	Round down	Round off
To the nearest thousand	2,847,000	2,846,000	2,847,000
To the nearest ten thousand	2,850,000	2,840,000	2,850,000
To the nearest hundred thousand	2,900,000	2,800,000	2,800,000

	Guide learners to express whole numbers to significant figures For example 857386321 i. five significant figures is 857390000 the fifth significant figure is 8 but the figure after it (i.e. the 6th significant figure) is 6 which is greater than 5. Therefore we add 1 to 8 to give 9. ii. four significant figures is 857400000 the fourth significant figure is 3 but the figure after it (i.e. the 5th significant figure) is 8 which is greater than 5. Therefore we add 1 to 3 to give 4 iii. three significant figures is 857000000 the third significant figure is 7 but the figure after it (i.e. the 4th significant figure) is 3 which is less than 5. Therefore we leave 7 as it is. <u>Assessment</u> 1. correct 287530 to: (a) 4 s.f. (b) 3 s.f. (c) 2 s.f. (d) 1 s.f.	
PHASE 3: **REFLECTOIN**	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. Ask learners how the lesson will benefit them in their daily lives.	

Week Ending:	**Period:**	**Subject:** Mathematics
Duration:		**Strand:** Number
Class: B7	**Class Size:**	**Sub Strand:** Numeration Systems

Content Standard: B7.1.1.1 Demonstrate understanding and the use of place value for expressing quantities recorded as base ten numerals as well as rounding to a given decimal place and significant figures.	**Indicator:** B7.1.1.1.4 Round decimals to the nearest tenth, hundredth, thousandths, etc.	**Lesson:** 4 of 5

Performance Indicator: Learners can Round decimals to the nearest tenth, hundredth, thousandths	**Core Competencies:** CP, CC
References: Mathematics Curriculum Pg.2	
Keywords: tenth, hundredth, thousandths	

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on what was taught in the previous lesson. Share with learners the performance indicators.	
PHASE 2: **NEW LEARNING**	Round (off, up and down) decimals to the nearest tenths, hundredths, thousandths……. For example: Round 486.3685 as indicated in the table below i. to the nearest whole number is 486. Discard figures after decimal point if the figure immediately after the decimal point is less than 5. If the figure is 5 or more more, add 1to the whole number. ii. to the nearest tenth (i.e. 1 d.p.) is 486.4 iii. to the nearest hundredth (i.e. 2 d.p.) is 486.37 iii. to the nearest thousandth (i.e. 3 d.p.) is 486.369 <u>Assessment</u> Round the following numbers to the nearest i. tenth ii. Hundredth iii. Thousandth a. 14.526 b. 78.460 b. 478.036 d. 1.23564	Counters, bundle and loose straws base ten cut square, Bundle of sticks

Number	Round to the nearest tenths	Round to the nearest hundredths	Round to the nearest thousandths
486.3685	486.4	486.37	486.369
0.0605368	0.1	0.06	0.061

PHASE 3: **REFLECTOIN**	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. Ask learners how the lesson will benefit them in their daily lives.	

Week Ending:	**Period:**	**Subject:** Mathematics
Duration:		**Strand:** Number
Class: B7	**Class Size:**	**Sub Strand:** Numeration Systems

Content Standard: B7.1.1.1 Demonstrate understanding and the use of place value for expressing quantities recorded as base ten numerals as well as rounding these to given decimal places and significant figures	**Indicator:** B7.1.1.1.5 Express decimal numerals to given significant and decimal places	**Lesson:** 5 of 5
Performance Indicator: Learners can correct numerals to given significant and decimal places	**Core Competencies:** CP, CC	
References: Mathematics Curriculum Pg.4		
Keywords: significant figure		

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on what was taught in the previous lesson. Share with learners the performance indicators.	
PHASE 2: **NEW LEARNING**	Using several examples explain to learners when zero (0) is significant in a decimal numeral. *A zero is significant when it follows a non-zero figure.* Example: i. 0.360 = the significant number in 0.360 is 3 but not 0. The 0 after the 6 is the 3rd significant figure. ii. 7.021 = the significant number in 7.021 is 7. The 0 after the 7 is the 2nd significant number. Guide learners to correct or round numbers to significant figures. Example: 1) 0.00234567 i. 3sf – 0.00235 ii. 4sf – 0.002346 iii. 6sf – 0.00234567 2) 84.40995000 i. 3sf – 84.4 ii. 4sf – 84.41 iii. 6sf – 84.4100 Guide learners to express decimal numbers to a given number of decimal places. Example:	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	(i) 745.9674 (3 d.p.) – 745.967 (2 d.p.) – 745.97 (1 d.p.) – 746.0 ii. Musa measured the length of his teacher's table and corrected his measurement to 2 decimal places as 0.76m. State the possible actual readings Musa might have obtained. Engage learners to investigate similar problems on significant figures. <u>Assessment</u> Correct the following numbers to i) 4 ii) 3 iii) 2 iv) 1 a) 17300 e) 20023 b) 0.423568 f) 23354204 c) 0.651234 g) 2785469 d) 46.10214 h) 0.60080107	
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. Ask learners how the lesson will benefit them in their daily lives.	

WEEK 3

Week Ending:	**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**	Say: Count the number of chairs and tables (or benches and desks) in the classroom. Write the number of each on the board. (For example: 40 chairs and 10 tables) Ask: How many girls and how many boys are present today? Write the number of each on the board. (For example: 25 girls and 15 boys). Say: Today we will learn how to compare quantities in a ratio format.	
PHASE 2: **NEW LEARNING**	Guide learners to determine ratio of given quantities. Example: Draw 2 oranges and 4 bananas on the board:  Say: to compare oranges and bananas we should use the words 'is to'. Write on the board ':' is to Say: 2 oranges is to 4 bananas. Allow learners to say '2 oranges is to 4 bananas' repeatedly to grasp the concept. Tell learners that the symbol for 'is to' is a colon (:).	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	Say: We can now write 2 oranges is to 4 bananas as a ratio. (2:4) Learners to solve more examples. i. There are 60 boys and 120 girls in a school. So the ratio of boys to girls in the school is $\frac{60}{120} = \frac{1}{2}$ <u>Assessment</u> 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. 2. Describe quantities with ratio language. 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 • Alhasan is twice as old as his son. • Musa is half the age of his father.	
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.	

Week Ending:	**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 ≠ 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**	Ask a pupil to explain ratio in his/her own words. (Example answer: ratio is a way of comparing two or more quantities). 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).	
PHASE 2: **NEW LEARNING**	Write 2 fractions on the board: $i)\ \frac{18}{20}$ $ii)\ \frac{25}{30}$. Ask pupils to write the fractions in their simplest form. (Answer: $i)\ \frac{18}{20} = \frac{9}{10}$ $ii)\ \frac{25}{30} = \frac{5}{6}$ 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. Engage learners to practice with more examples. <u>Assessment</u> Aisha polishes 8 square yards of floor tiles every 7 minutes, so there are $\frac{8}{7}$ square yards per minute.	Counters, bundle and loose straws base ten cut square, Bundle of sticks
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.	

Week Ending:	**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 = $\frac{4}{9}a$ Jantuah's share = $\frac{3}{9}$ x a = 24000 a = $\frac{9\,x\,24000}{3}$ = 72000 therefore the total amount shared is GH₵72000	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	Have learners go ahead to find Kafui and Adoley's share. Let learners practice with more examples. <u>Assessment</u> 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?	
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.	

Week Ending:	**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**	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 the proportional reasoning to find missing values in the tables, and plot pairs of values on the coordinate plane Have learners find the missing value marked *x* in a table of equivalent ratios. 3 | 10 6 | x 9 | 30 y | 40 $= \frac{x}{6} = \frac{10}{3}$ means the value of $x = \frac{10}{3} \times 6 = \frac{60}{3} = 20$ Engage learners to practice with more examples. Assessment 4 | 8 | 12 | 16 | 20 | 24 15 | 30 | m | 60 | n | 90 Find the values of ***m*** and ***n***.	Counters, bundle and loose straws base ten cut square, Bundle of sticks
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.	

Week Ending:	**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: *A rate is a ratio that compares two quantities with different units of measure.* 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: $: \frac{18\ miles}{3\ hours}$ = 18 miles : 3 hours = 18 miles in 3 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 $= \frac{18\ miles}{3\ hours} = \frac{\chi\ miles}{1\ hours}$ → 18 x 1 = 3 x χ → 3χ = 18 → χ = 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.	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	The rate of discount is given as a percent. The sale price is the difference between the list price and the discount • Discount = Rate of Discount × List Price $D = R \times LP$ • Sale Price = List Price − Discount $SP = LP - D$ 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% of ¢15 D = 0.15 x ¢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% of ¢ 700 C = 0.35 x ¢ 700 C = ¢ 245 Have learners practice with more examples. <u>Assessment</u> 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.	

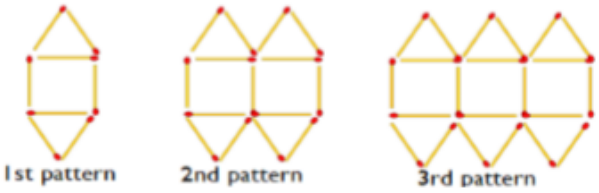
WEEK 4

Week Ending:	**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**	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 extend a given symbolic relation.  Let learners study the pattern made with match sticks below and draw the fifth pattern. Learners to analyze How each pattern differ from the pattern that comes before it? Have learners to copy and complete the table for the number of sticks in each pattern. Engage learners to study the pattern of numbers below and complete table.	Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards

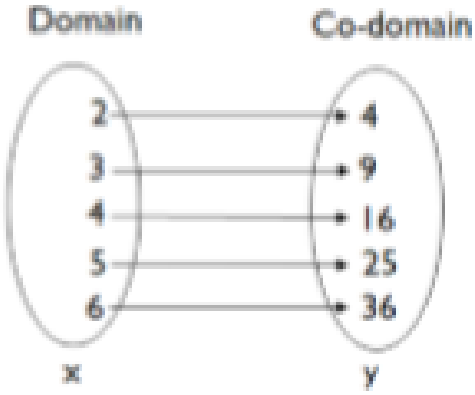
Pattern No.	1	2	3	4	5	6	7
Number of sticks	8	15					

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

<table>
<tr>
<td></td>
<td>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?

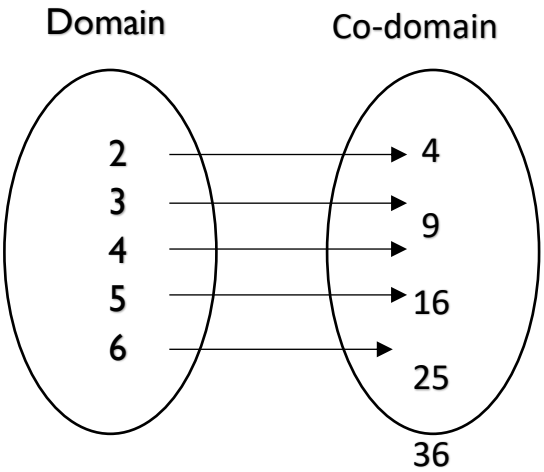
 

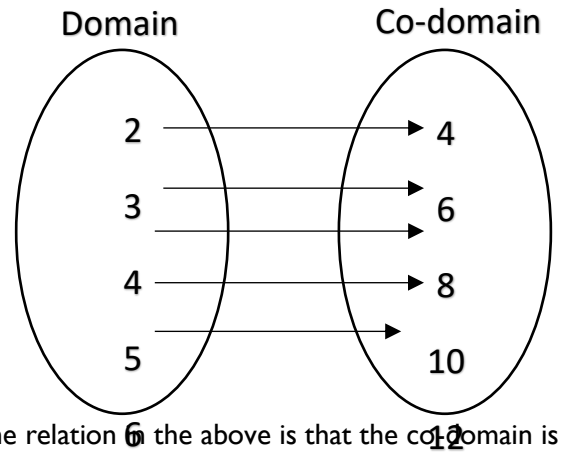
<u>Assessment</u>
Copy and complete the table for the number of sticks in each pattern.
<table>
<tr><td>Domain</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>Co-domain</td><td>4</td><td>7</td><td>10</td><td></td><td>16</td><td></td><td></td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>PHASE 3:
REFLECTION</td>
<td>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.</td>
<td></td>
</tr>
</table>

WEEK 5

Week Ending:	**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. *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 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 "$y = x^2$".* Example:  *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 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.*	Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards

	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. (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. 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.	

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

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

Week Ending:	**DAY:**	**Subject:** Mathematics
Duration:		**Strand:** Algebra
Class: B7	**Class Size:**	**Sub Strand:** Patterns and Relations

Content Standard:	**Indicator:**	**Lesson:**
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.	B7.2.1.1.3 Identify the relation or rule in a pattern/mapping presented numerically or symbolically and predict subsequent elements	3 of 3

Performance Indicator:	**Core Competencies:**
Learners can identify the relation or rule in a pattern	Critical Thinking and Problem solving (CP)

References: Mathematics Curriculum Pg. 30-31

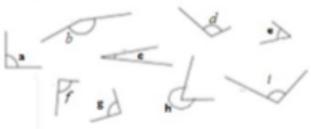
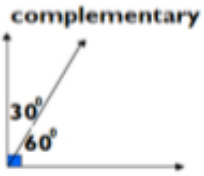
Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: **NEW LEARNING**	Guide learners to determine the rule for a given symbolic pattern.  (table below) Guide learners to determine the rule for a given numerical pattern.  We can find the rule for the pattern by using either; 1. The method of inspection. Each number is mapped onto the sqaure of itself. Therefore if x stands for any element, then the rule for the pattern is y x^2 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 difereence between elements in the co-domian and domain. If the 1st difference are the same then we use the formula y= ax + b	Abacus, Color coded materials, place value chart, Number facts flash cards; Flashcards

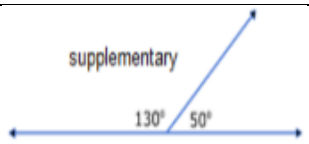
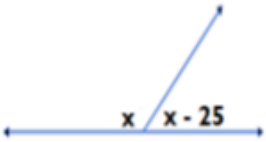
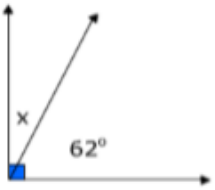
Shape number	1	2	3	4	5	6	7	8	9
No. of matchsticks	3	5	7	9	11				
Rule for the pattern	Number of matchsticks = shape number *x*								

	a = $\frac{constant\ difference\ of\ co-domain}{constant\ difference\ of\ domain}$ domain = 0 3 6 9 12 (3 3 3 3) co-domian = -1 5 11 17 (6 6 6) therefore a = $\frac{6}{3}$ = 2 Now we find b, which is a constant to be determined using x = 3 and y = 5. y= ax + b 5= 2(2) + b b = 5-4 b = 1 therefore the rule is y= 2x + 1 Have learners practice with more examples in their workbooks. <u>Assessment</u> 1. Find the rule for the following patterns 0 1 2 3 4 5 ↓ ↓ ↓ ↓ ↓ ↓ 2 5 8 11 14 17 0 3 6 9 12 ↓ ↓ ↓ ↓ ↓ -1 5 11 17 23 0 1 2 3 4 ↓ ↓ ↓ ↓ ↓ 2 4 6 8 10	
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.	

WEEK 6

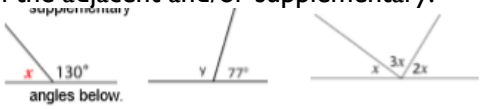
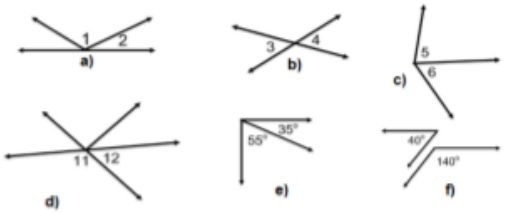
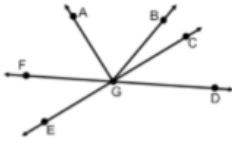
Week Ending:	**DAY:**	**Subject:** Mathematics	
Duration:		**Strand:** Geometry & Measurement	
Class: B7	**Class Size:**	**Sub Strand:** Shape and Space	
Content Standard: B7.3.1.1 Demonstrate understanding of angles including adjacent, vertically opposite, complementary, supplementary and use them to 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			

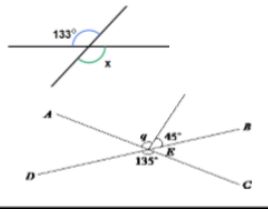
Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: **NEW LEARNING**	Guide learners to sort angles into those which are right, acute, obtuse or reflex angles from photocopied worksheets with several angles to measure.  Use a protractor to draw angles such as 30o, 45o, 60o, 75o, 90o, 120o, 150o, 270o, 300o, etc.  Guide learners to apply the fact that; (i) complementary angles are two angles that have a sum of 90°, and  (ii) supplementary angles are two angles that have a sum of 180° to solve problems.	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° (group like terms) x + x = 180 + 25 (simplify both sides) 2x = 205 (divide through by 2) $x = \frac{205}{2}$ x = 102.5° E.g.2. determine the missing angle marked x.  Since complementary angles sum up to 90°, x + 62 = 90° (group like terms) x = 90 – 62 (simplify both sides) x = 28° 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.	

Week Ending:	**DAY:**	**Subject:** Mathematics
Duration:		**Strand:** Geometry & Measurement
Class: B7	**Class Size:**	**Sub Strand:** Shape and Space

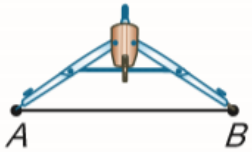
Content Standard: B7.3.1.1 Demonstrate understanding of angles including adjacent, vertically opposite, complementary, supplementary and use them to solve problems.	**Indicator:** B7.3.1.1.3 Use adjacent, supplementary and vertically opposite angles to solve problems	**Lesson:** 1 of 2
Performance Indicator: 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		

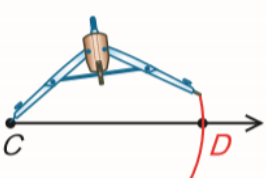
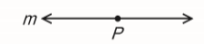
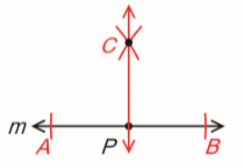
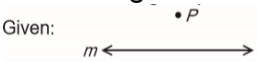
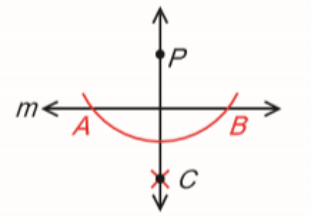
Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: **NEW LEARNING**	Guide learners to determine the angle(s) marked with letters in the adjacent and/or supplementary.  Guide learners to identify each pair of angles as adjacent, vertically opposite, complementary or supplementary.  Use the figure at the right to identify and label the following angles i. two acute vertical angles. ii. two obtuse vertical angles. iii. a pair of adjacent angles iv. a pair of complementary angles. v. an angle supplementary to FGE∠  	Empty chalk boxes, tins, cut out shapes from cards.

	Guide learners to use adjacent, vertically opposite, complementary or supplementary to solve problems. Determine the angle(s) marked with letters  	
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.	

WEEK 7

Week Ending:	**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**	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Show learners the pair of compasses and ask, what can we do with a pair of compasses? Allow learners to brainstorm. Introduce the lesson by sharing performance indicators.	
PHASE 2: **NEW LEARNING**	Brainstorm learners to explain the following; *A construction is a geometric drawing that is made using only an unmarked straightedge and a compass.* *A compass is a geometric tool used to draw a circle or a part of a circle, called an arc.* 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: Step 1: Draw a ray with endpoint C.  Step 2: Open the compass to the length of $\overrightarrow{AB}$  	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:* Given:  *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: Step 3: Draw $\overleftrightarrow{CP}$.*  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. Given:  *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 $\overleftrightarrow{CP}$.*  <u>Assessment</u> Engage learners to practice with several examples.	

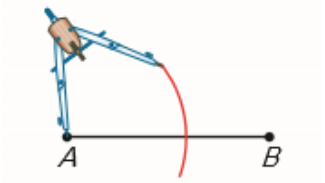
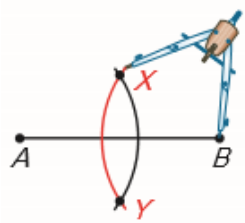
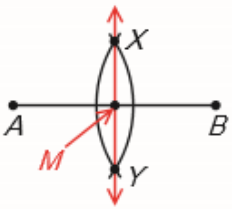
PHASE 3: **REFLECTION**	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending:	**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)

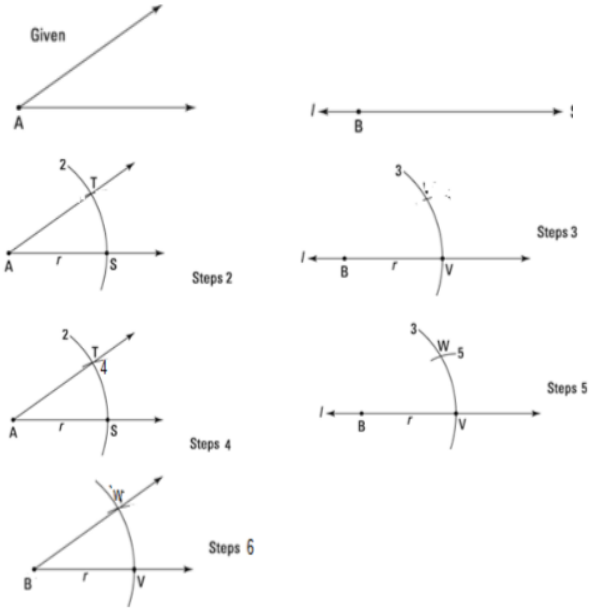
References: Mathematics Curriculum Pg. 51-52

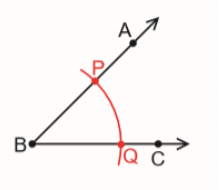
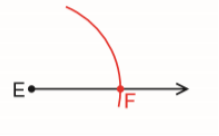
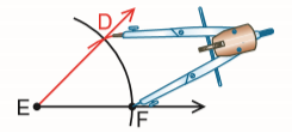
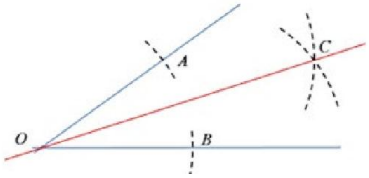
Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Call volunteer learners to the board to solve sample questions. Introduce the lesson by sharing performance indicators.	
PHASE 2: **NEW LEARNING**	Guide learners to use a pair of compasses and a ruler to construct a perpendicular bisector of a given line segment. To construct a perpendicular at a point on a line segment *Step 1: Put the compass point on point A and construct an arc. Be sure the opening is greater than half* $\overrightarrow{AB}$  *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.*  *Step 3: Draw* $\overrightarrow{XY}$*. Label the intersection of* $\overrightarrow{AB}$ *and* $\overrightarrow{XY}$ *as point M.* $\overrightarrow{XY}$ *is a perpendicular bisector of* $\overrightarrow{AB}$*. Point M is the midpoint of* $\overrightarrow{AB}$  <u>Assessment</u> 1. Draw and bisect the following lines a. $\overrightarrow{AB}$ = 8cm b. $\overrightarrow{AB}$ = 5.5cm	Rule, pencil , a pair of compass, a pair of divider and protractor.

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.	

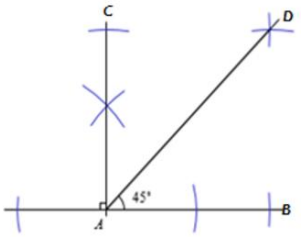
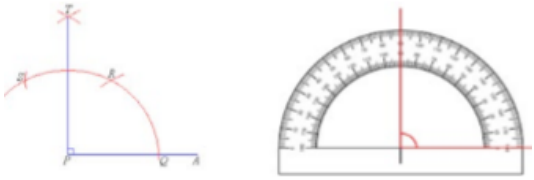
WEEK 8

Week Ending:	**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**	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 a pair of compasses and a ruler to copy a given angle A. 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.  Guide learners to construct an angle <DEF congruent to angle ABC	Rule, pencil , a pair of compass, a pair of divider and protractor.

	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 as 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.	

Week Ending:	**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 90^0 and 45^0	**Lesson:** 2 of 2	
Performance Indicator: Learners can construct angles of 90^0 and 45^0		**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**	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 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˚   Have learners construct an angle of 45˚ by bisecting an angle of 90˚. <u>Assessment</u> I. Construct <ABC = 45º such that $\|AB\|$ = 5cm and $\|BC\|$ = 6cm. bisect <ABC = 45º II. Construct <ABC = 90º and bisect it.	Rule, pencil , a pair of compass, a pair of divider and protractor.

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.	

WEEK 9

	DAY:	**Subject:** Mathematics
Duration: 60MINS		**Strand:** Handling Data
Class: B7	**Class Size:**	**Sub Strand:** Statistics

Content Standard: B7.4.1.1 Select, justify, and use appropriate methods to collect data	**Indicator:** B7.4.1.1.1- Select and justify a method to collect data to answer a given question	**Lesson:** 1 of 2

Performance Indicator: Learners can select and justify a method to collect data	**Core Competencies:** Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)

References: Mathematics Curriculum Pg. 77-80

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	In groups, Ask learners to find answers for the following questions. a. How many tables are in your classroom? b. How many chairs are in your classroom? c. How many male teachers teach at the school? d. How many female teachers teach at the school? Have learners present their findings to the class for discussion and how they arrived at their answers. Share learning indicators and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Brainstorm learners for the meaning of Data. *Data are any numerical facts, information, or measurement of something* In small groups, learners discuss and write down how they would make decisions in the following situations, what facts they would take into account and how they would collect these 'facts: (a) The type of drinks to buy for a class party. (b) The make of football boots to buy for the school team. (c) Do people who eat more fufu develop pot belly? (d) The number of desks in each classroom. (e) The amount of money B6 students spend on bus fare to school every month. (f) Buy a mobile phone from an online shop. Lead a discussion on the methods of data collection below and ask them to identify which method they will use to gather the facts for each situation in E.g.1. above) That is questionnaires, interview, observation, experiments, survey, databases, electronic media or internet. <u>Assessment</u> Learners to use different methods to collect data on students age in the school	Counters, bundle and loose straws base ten cut square, Bundle of sticks, rectangular cut out, bottle tops, algebra tiles

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.	

Week Ending:	**DAY:**	**Subject:** Mathematics
Duration: 60MINS		**Strand:** Handling Data
Class: B7	**Class Size:**	**Sub Strand:** Statistics

Content Standard: B7.4.1.1 Select, justify, and use appropriate methods to collect data	**Indicator:** B7.4.1.1.2- Design and administer a questionnaire for collecting data to answer questions and record the results.	**Lesson:** 1 of 2

Performance Indicator: Learners can design and administer a questionnaire	**Core Competencies:** Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)

References: Mathematics Curriculum Pg. 77-80

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**	Show a sample questionnaire to learners and let them observe how it is. Demonstrate how to use the questionnaire with learners. Guide learners to conduct a survey by producing a question form (such as the one below) and collecting real information. 1) Hello, What's your name? _____ 2) How old are you? _____ 3) What's your favourite school subject? 4) What's your worst subject? _____ 5) What's the most important school subject? _____ 6) What is your favourite hobby _____ 7) What's your favourite day of the week? _____ 8) How much do you spend on bus fare to school every day? _____ Let learners use the table below to organize the data obtained with the question form (or questionnaire). Name | Age | Favourite subject | Worst subject | Important subject | Favourite hobby | Favourite weekday | Daily bus fare (cedes) <u>Assessment</u> Learners design and administer a questionnaire for collecting favorite food of students in the school.	Sample questionnaire
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.	

WEEK 10

Week Ending:	**DAY:**	**Subject:** Mathematics
Duration: 60MINS		**Strand:** Handling Data
Class: B7	**Class Size:**	**Sub Strand:** Statistics

Content Standard: B7.4.1.1 Select, justify, and use appropriate methods to collect data	**Indicator:** B7.4.1.1.3- Organize and present data from a survey into a table and/or chart, and analyze it to solve and/or pose problems.	**Lesson:** 1 of 2

Performance Indicator: Learners can tallies to represent data in a frequency table	**Core Competencies:** Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)

References: Mathematics Curriculum Pg. 77-80

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**	Explain to pupils the meaning of tally marks (strokes which represent the number of time a particular event or appears) Engage learners to count the number of tables and chairs in the classroom. Example: tables = 10, chairs = 12 Demonstrate how to represent the data collected using tallies. Tables = 𝍸 𝍸 Chairs = 𝍸 𝍸 // In pairs, let learners use tallies to represent the number of boys and girls in the classroom. Have them present their work for discussion. Task learners to solve more questions using tallies. Example: 20 learners are each asked to give the number of sisters they have. The data is collected as follows: Michael (4), Issa (4), Janet (5), Abass (3), Jane (1) Idrissa (2) and Fanta (1). Ask learners to work in pairs and display the information with tally marks. <u>Assessment</u> Henry scored the following marks in an Exams. Mathematics 14, English 10, Social Studies 13, French 19, Business Studies 8 and Integrated Science 11. Use tallies to organize into a frequency table marks obtained in the exams.	Sample questionnaire

<table>
<tr><td></td><td>Guide learners to construct a frequency table and discuss the titles in each column.<table><tr><td>Event (Marks)</td><td>Tally</td><td>Frequency</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table></td><td></td></tr>
<tr><td>PHASE 3:
REFLECTION</td><td>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.</td><td></td></tr>
</table>

Week Ending:	**DAY:**	**Subject:** Mathematics
Duration: 60MINS		**Strand:** Handling Data
Class: B7	**Class Size:**	**Sub Strand:** Statistics

Content Standard: B7.4.1.1 Select, justify, and use appropriate methods to collect data	**Indicator:** B7.4.1.1.3- Organize and present data from a survey into a table and/or chart, and analyze it to solve and/or pose problems.	**Lesson:** 2 of 2

Performance Indicator: Learners can use tally to represent data in a frequency table	**Core Competencies:** Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)

References: Mathematics Curriculum Pg. 77-80

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**	Revise with learners on the meaning of tally and how to use tally to represent data collected. Guide learners solve more examples on how to use tallies to organize into a frequency table. Use the data below which was obtained by a group of learners for the number of people living in households around their houses. 3 4 2 4 3 2 2 5 4 3 2 6 3 5 4 1 2 6 3 5 5 2 4 1 5 4 2 4 3 4 2 4 4 6 2 4 3 4 2 4 Guide learners to complete the frequency table below for the data recorded from the survey of people living in households around their houses. No./ Household | Tally | Frequency | Angle of sector 1 | // | 2 | $\frac{2}{40} \times 360 = 18^c$ 2 | //// //// | 10 | 3 | //// // | 7 | 4 | //// //// /// | 13 | 5 | //// | 5 | 6 | /// | 3 | Learners to draw a pie chart to illustrate the data in the frequency table (i.e. in E.g. 1 above). They write their conclusion about the number of people living in the households and/or pose questions on the pie chart.	Sample questionnaire

<table>
<tr>
<td></td>
<td>In pairs learners draw a graph or chart for data organized in a frequency tables and use it to answer and/or pose questions.

<u>Assessment</u>
The table below shows how Fayol spends his day. Complete the blanks in the table with information on how you spend your day. Draw a double bar graph to compare how you spend your day with Fayol.
<table><tr><td>Activity</td><td>School</td><td>Sleeping</td><td>Homework</td><td>Eating</td><td>Other</td></tr><tr><td>No. of hours</td><td>8</td><td>8</td><td>3</td><td>1</td><td>4</td></tr><tr><td>No. of hours</td><td></td><td></td><td></td><td></td><td></td></tr></table></td>
<td></td>
</tr>
<tr>
<td>PHASE 3:
REFLECTION</td>
<td>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.

<u>Homework</u>
The table below shows the amount of rainfall recorded in millimeters per month in the two towns in Ghana. Draw a double bar c hart to represent the data, write your conclusion and/or pose questions based on the chart
<table><tr><td></td><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td></tr><tr><td>Kumasi</td><td>5</td><td>10</td><td>15</td><td>20</td><td>50</td><td>45</td><td>55</td><td>35</td><td>40</td><td>50</td><td>35</td><td>10</td></tr><tr><td>Oda</td><td>3</td><td>10</td><td>13</td><td>25</td><td>40</td><td>50</td><td>60</td><td>50</td><td>40</td><td>45</td><td>35</td><td>8</td></tr></table></td>
<td></td>
</tr>
</table>

WEEK 11

Week Ending:	**DAY:**	**Subject:** Mathematics
Duration:		**Strand:** Handling Data
Class: B7	**Class Size:**	**Sub Strand:** Statistics
Content Standard: B7.4.1.2 Determine the measures of central tendency	**Indicator:** B7.4.1.2.1 Calculate the mean for a given ungrouped data and use it to solve problems.	**Lesson:** 1 of 2
Performance Indicator: Learners can use tally to represent data in a frequency table	**Core Competencies:** Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	
References: Mathematics Curriculum Pg. 77-80		

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 explain the measures of central tendency • Mean: The average of given numbers • Median: Is the middle number in a sorted list of numbers • Mode: the most occurring number in a sorted list of numbers. Guide learners to find the mean for a data set by dividing the sum of all the items in the data set by the by the number of items. Example: The mean for the data set {8, 9, 7, 6, 8,10} $= \frac{8+9+7+6+8+10}{6}$ In groups, let learners find the mean for the data set below which is the marks obtained out of a total of 5 in a mathematics class test. 3 4 2 4 3 2 2 5 4 3 4 1 2 6 3 5 5 2 4 1 Demonstrate to learners on how to find the median for a data set by arranging the items in the set in an array and identifying the middle item. Example: Find the median of 19, 29, 36, 15, and 20. Start by arranging the numbers in ascending order 15,19, 20, 29, 36 and choose the middle number to be 20. NB. since there are 5 values (odd number), 20 is the median (middle number) Demonstrate to learners on how to find the median for a data set in a frequency table.	Sample questionnaire

<table>
<tr>
<td></td>
<td>
<u>Assessment</u>
Find the mean for the marks obtained out of a total of 5 in a mathematics class test presented in the frequency table:
<table>
<tr><td>Score</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Frequency</td><td>2</td><td>6</td><td>4</td><td>5</td><td>3</td></tr>
</table>

Find the mean of the ages of children at a party presented in the frequency table
<table>
<tr><td>Ages (x):</td><td>1</td><td>3</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>Frequency (f):</td><td>2</td><td>5</td><td>6</td><td>10</td><td>8</td><td>5</td><td>3</td><td>1</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>PHASE 3:
REFLECTION</td>
<td>
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.

<u>Homework</u>
Solve problems involving calculating the mean or average.
i. A shop keeper sold the following loaves of bread over the last 6 days: 25, 48, 25, 33, 57, 50. What was the average number of loaves sold each day?
ii. Sena has had the following scores in five of the common core subjects this term: 75, 87, 90, 88, 79. If she wishes to have an average score of 85, what must she score on the sixth test?
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</table>

WEEK 12

REVISION AND END OF TERM ASSESSMENT

Week Ending:	**Period:**	**Subject:** Mathematics
Duration: 50 mins		**Strand:** Strands treated for the term
Class: B7	**Class Size:**	**Sub Strand:** Sub Strands for the term
Content Standard: Demonstrate knowledge and understanding in the topics treated so far.	**Indicator:** Recall and summarize all what they have learnt within the term.	
Performance Indicator: Learners can recall and summarize all what they have learnt within the term	**Core Competencies:** Critical thinking and problem solving	
References: Mathematics Curriculum Pg. **1-22**		

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Using blackboard illustrations, review learners understanding in the previous lesson. Share performance indicators and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Revise with learners to form numbers with given multi-base ten materials, given that a small cube is 1,000; 10 small cubes is a rod (i.e. 10,000), 10 rods is a flat (i.e. 100,000); and 10 flats is a block (i.e. 1000,000) Learners to use multiples of 10s, 50s, 100s and 200s to represent numbers in multiples of ways E.g. 5,560 = 20×200 + 10×100 +11×50 + 1×10; Guide learners to apply the halving and doubling techniques to determine the product of two given numbers. i. 28 x 5, think 14 x 10=140 ii. 125 x 4, think (125 x 2) x 2 = 250 x 2 = 500 Have learners to solve mathematics problems involving the properties of operations. Example: the commutative property. *In mathematics, a binary operation is commutative if changing the order of the operands does not change the result.* *If a and b are rational numbers and --- a x b = b x a. Then we say multiplication of rational numbers is commutative.* *E.g. 2 x 3 = 3 x 2*	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	Guide learners use mental strategies to perform subtraction using words like minus, from a number take, , find the difference, and what must be added to make; E.g.1. what is 109 minus 49 = 60 E.g.2. from 89 take away 32 Engage learners to express a given number as a product of a given number or numbers. E.g. i. $32 = 2\times2\times2\times2\times2 . = 2^5$ ii. $81 = 3\times3\times3\times3 = 3^4$ iii. $49 = 7\times7 = 7^2$ iv. $16 \times 27 = 2\times2\times2\times2 \times 3\times3\times3 = 2^4 \times 3^3$ Perform activities with pupils to discover that for any natural number a, $a^0 = 1$ Example: i.e. (i) $\frac{24}{24}$ $24 \div 24 = 1$ 2222 2222 (ii) $24 \div 24 = 24\text{-}4 = 20 = 1$ Guide learners to verify why the value of any natural number with exponent zero is 1. Verification:. $\frac{x}{x}=1$, but from indices, $\frac{x}{x}=x^0$, hence $x^0=1$ for any natural number <u>Assessment</u> Simplify the following 1) $2^3 \times 2^{-4}$ 2) $2^2x2^4x2^{-3}$ 3) $5^6x5^{-2}x5^{-3}$ 4) 2^4x2^{-3} 5) 5^3x5^{-3} Express the following as a product of their prime factors 1) 180 2) 72 3)81 4) 49 5) 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.	

Week Ending:	**Period:**	**Subject:** Mathematics
Duration: 50 mins		**Strand:** Strands treated for the term
Class: B7	**Class Size:**	**Sub Strand:** Sub Strands for the term
Content Standard: Demonstrate knowledge and understanding in the topics treated so far.	**Indicator:** Preparation towards vacation	
Performance Indicator: Learners can answer all end of term assessment questions in their exercise books.	**Core Competencies:** Critical thinking and problem solving	
References: Mathematics Curriculum Pg. **1-22**		

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Ask learners to bring and display all the materials needed for the assessment. Educate them on the consequences of examination mal practice.	Exercise books, pen, pencils, erasers, Answer sheets.
PHASE 2: **NEW LEARNING**	Engage learners to arrange themselves properly to sit for the assessment test. Mark learners answer sheets or exercise books. Fill in learner's SBA books and report cards. Distribute learners answer sheets or exercise books for feedback.	SBA, Assessment Questions and exercise books.