SECOND TERM
WEEKLY LESSON NOTES
WEEK 2

Week Ending: 19-01-2024		DAY:		Subject: Mathematics	
Duration: 60MINS				Strand: Number	
Class: B9		Class Size:		Sub Strand: Ratios and Proportion	
Content Standard: B9.1.4.1 Apply the understanding of ratio, rate and proportions to solve problems that involve rates, ratios, and proportional reasoning and use it to solve real world mathematical problems		Indicator: B9.1.4.1.2 Use proportional relationships to solve multistep ratio and percent problems, examples: simple interest, tax, discount and commissions, NHIL, depreciation, insurance, etc.			Lesson: 1 of 1
Performance Indicator: Learners can solve problems involving simple interest, tax, discount and commissions, NHIL, depreciation, insurance.				Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	
References: Mathematics Curriculum Pg. 175					
New words:					

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Share performance indicators and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Guide learners to solve problems on simple interest. *Example 1: A girl deposited GH₵ 4500 at the bank at a rate of 3% per annum for three years. Find the simple interest. What is the amount at the end of the fifth year?* *Solution* $I = \frac{P \times R \times T}{100} = \frac{4500 \times 3 \times 3}{100} = GHC\ 405$ *Amount at the end of the fifth year = 4500 + $\frac{4500 \times 3 \times 5}{100}$* *= 4500 + 675 = GHc 5,175.00* Guide learners to solve problems on tax (VAT). The VAT rate of Ghana is 12.5%. *Example 2: A man bought an item at GH₵ 4500.00, VAT inclusive. Calculate: b) the basic cost of the item. c) the VAT paid by the man.* *Solution* $VAT = \frac{100}{112.5} * 4500 = 4,000$ *b) the basic cost of the item = GHc 4,000*	Counters, bundle and loose straws base ten cut square, Bundle of sticks

c) the VAT paid by the man = $\frac{12.5}{100} * 4000 = 500$

Guide learners to solve problems on discount.

Example 3: If a car costs GH₵ 80,500.00, what is its new value if there is a discount of 10%?

Solution
$\frac{10}{100} * 80,500 = 8050$

New value = 80,500 – 8,050 = 72,450

Guide learners to solve problems on commission.

Example 4: A car agent's commission on the sale of a car is $3\frac{1}{2}$%. Calculate the commission on a car sold for GH₵68,000.00.

Solution
$\frac{3.5}{100} * 68000 = 2,380$

Guide learners to solve problems involving depreciation. The value of a mobile phone depreciates at the following rate:

Year of manufacturing	Depreciation on the original value
In the first year	5%
In the second year	10%
In the third year	15%
In the fourth year	22%

The original value of the mobile phone is GH₵ 1800.00. Find the value of the mobile phone at the end of each of the first four years.

Guide learners to solve problems involving NHIL.

Example 5: The NHIL inclusive price of a television set is GH₵1200.00. If the NHIL is charged at a rate of 2.5%, find
b) The cost of the television set (NHIL exclusive). c) The NHIL charged.

Solution
*b) the cost of the television set (NHIL exclusive) = 100/102.5 * 1200*
= 1170

c) The NHIL charged. = 1200 – 1170 = 30

Assessment
Kofi Mireku insured his house and paid a premium of GH₵ 30,000.00. If the insurance company fixed the rate at 5% of the value of the house, calculate the insured value of the house.

| 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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Duration: 60MINS			Strand: Number	
Class: B9	Class Size:		Sub Strand: Ratios and Proportion	

Content Standard: B9.1.4.1 Apply the understanding of ratio, rate and proportions to solve problems that involve rates, ratios, and proportional reasoning and use it to solve real world mathematical problems	Indicator: B9.1.4.1.3 Use knowledge of rates and proportional reasoning to solve problems involving SSNIT benefits and contributions.	Lesson: 1 of 1
Performance Indicator: Learners can apply knowledge of rates and proportional reasoning to solve problems involving SSNIT contributions and benefits	Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	

References: Mathematics Curriculum Pg. 175

New words:

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Begin by asking learners what they know about social security or retirement plans. Introduce the concept of SSNIT in Ghana and its importance in providing financial security for workers after retirement. Briefly explain the main benefits offered by SSNIT (lump sum payment, monthly pension, survivors' benefits) and discuss who is eligible for these benefits. Share performance indicators and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Describe the obligations of the employer/employee and the contribution rates. <table><tr><td></td><td>Act 766</td><td>PNDC Law 247</td></tr><tr><td>Employer</td><td>13.0% of basic salary</td><td>12.5 of basic salary</td></tr><tr><td>Worker</td><td>5.5% of basic salary</td><td>5.0% of basic salary</td></tr><tr><td>Total</td><td>18.5% of basic salary</td><td>17.5% of basic salary</td></tr></table> Divide learners into small groups and assign each group a hypothetical salary. Provide them with information sheets about different salary levels and their corresponding SSNIT contributions. Challenge them to calculate their monthly deductions and discuss the impact of different earning levels on contributions. Example 1: Calculate employee/employer contributions to SSNIT under Act 766.	Counters, bundle and loose straws base ten cut square, Bundle of sticks

A worker's basic monthly salary is GH₵3,256.50.
a. Calculate the SSNIT contributions under Act 766;
i) by the employer ii) by the employee
b. What is the total SSNIT contributions at the end of every month?

Solution
i) by the employer = 0.13 * 3256.50 = 423.35
ii) by the employee = 0.055 * 3256.50 = 179.11
b) total SSNIT contributions = 423.35 + 179.11 = 602.46

Example 2: Calculate employee/employer contributions to SSNIT under PNDCL 247.

Mr Bediako's monthly SSNIT contribution under PNDCL 247 is GH₵440.54. How much does his employer contribute to SSNIT on his salary? Hence, calculate his basic salary per month.

Solution

Let a represent his basic salary per month
total SSNIT contributions = employer + employee

*GH₵440.54 = (0.125 * a) + (0.05 * a)*

GH₵440.54 = a (0.125 + 0.05)

GH₵440.54 = a 0.175

$$a = \frac{440.54}{0.175} = GH₵2517.37$$

therefore the basic salary of Mr Bediako is GH₵2517.37

Guide learners to calculate employee benefits from SSNIT under Act 766.

Example: Mr Addai retired at age 60 last year after working and contributing for 20years. If the average of his best salary for 3 years (36 months) over the 20-year period was GH₵15,000.00, calculate his full pension under the National Pension Act 2008, (Act 766).

Calculation for full pension
Qualifying age = 60years
Average best 3years' salary = GH₵15,000
Pension right for 20years = 43.13% (refer to the table on Pension Rights above)
Annual pension to Mr. Addai = 43.13/100 × 15,000 = GH6,469.5
Monthly pension to Mr Addai = 6469.5/12 = 539.13

Guide learners to calculate employee benefits from SSNIT under PNDCL 247.

Example: Mr Bema, a history teacher at Academicals Senior High School, retired in 2009 after 25 years of service. Throughout this 25-year period he had been

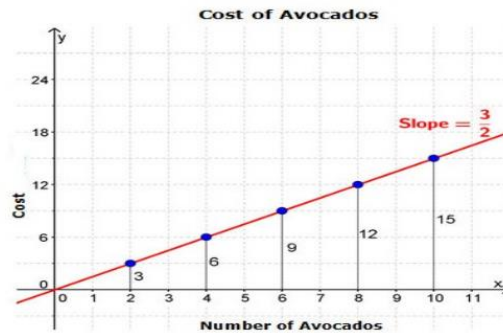|	
	an active contributor to the SSNIT Pension Scheme. As the student who has learnt about social security, you are to help Mr Bema to calculate his annual pension using his best three years' salary of GH₵19,500. Calculation for full pension Qualifying age = 60years Average best 3years' salary = GH₵19,500 Pension right for 25years = 57.5% (refer to the table on Pension Rights above) *Annual pension to Mr. Bema = 57.5/100 × 19.500 = GH11,212.5* *Monthly pension to Mr Addai = GH11,212.5/12 = GH934.38* Give learners a simulated monthly budget and have them factor in their estimated SSNIT contribution based on their hypothetical salary. Challenge them to adjust their spending or income sources to manage their finances responsibly with the contribution deduction. Learners can role-play job interviews where they ask and answer questions about SSNIT benefits and contributions, simulating real-life scenarios where understanding these aspects is crucial Assessment 1. A worker contributed for seven and half years before being rendered incapacitated. If the best salary for over the 3-year (36 months) period was GH₵ 8,450.40, calculate the invalidity benefit for the worker. 2. Mr Mensah's total SSNIT contribution stood at GH₵ 112,426.29 at the time of his demise. Calculate his survivor's benefit if the current interest rate is 15%.	
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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Content Standard: B9.1.4.1 Apply the understanding of ratio, rate and proportions to solve problems that involve rates, ratios, and proportional reasoning and use it to solve real world mathematical problems	Indicator: B9.1.4.1.4 Recognise and graph proportional relationships, interpreting the unit rate as the slope of the graph and use these to solve problems	Lesson: 1 of 1
Performance Indicator: Learners can calculate and interpret unit rates as the slope of a graph and solve problems involving proportional relationships.	Core Competencies: Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	

References: Mathematics Curriculum Pg. 179

New words: proportional relationship, unit rate, slope

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Engage learners with examples of proportional relationships in their daily lives (e.g., buying items by weight or quantity, earning money for hours worked). Introduce the terms "proportional relationship," "unit rate," and "slope." Share performance indicators and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Divide learners into teams and provide grocery items. Challenge them to find proportional relationships between different items (e.g., cost of bananas per pound, number of cookies per package). Have them create tables to organize data and identify constant ratios. Distribute graph paper and guide learners to graph their data points. Discuss the characteristics of graphs of proportional relationships (straight lines passing through the origin). Introduce the concept of slope as "rise over run" and demonstrate how to calculate it. Slope $= \frac{(y2-y1)}{(x2-x1)}$ From the graph below, lets pick x coordinates to (4, 8) and y coordinates (6, 12) Slope $= \frac{(12-6)}{(8-4)} = \frac{6}{4} = \frac{3}{2}$	Choose items sold by weight or quantity (e.g., bananas, apples, cereal boxes, cookies). Scales or measuring cups. Graph paper or whiteboard.

	Emphasize that slope represents the unit rate in proportional relationships. Present scenarios involving proportional relationships (e.g., distance traveled, recipe proportions, costs). Guide learners to use graphs, slopes, and unit rates to solve problems. Example: The graph below shows the cost of avocados. The unit rate, from the data, is ₵1.50 per avocado, which is the same as the slope of the line connecting the data points$\left(\frac{3}{2}\right)$. i. From the graph, how much does eight avocados cost? ii. Also, using the graph how much does 15 avocados cost? Solution i. eight avocados cost = GH12 ii. We can't use the graph to determine the cost of 15 avocados. So if 8 avocados = GH12 then 15 avocados = ? $\frac{15}{8} * 12 = 22.5$ Therefore 15 avocados cost GH22.50 Assessment i. From the graph, how much does 3 avocados cost? ii. From the graph, how much does 5 avocados cost? iii. Also, using the graph how much does 20 avocados cost? iv. Using the graph how much does 12 avocados cost? v. From the graph, how much does 11 avocados cost?	
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.	