THIRD TERM
WEEKLY LESSON NOTES
WEEK 9

Week Ending: 25-08-2023	**DAY:**	**Subject:** Mathematics
Duration: 60MINS		**Strand:** Geometry & Measurement
Class: B8	**Class Size:**	**Sub Strand:** Add & subtract Vectors.
Content Standard: B8.3.2.2 Demonstrate understanding of addition and subtraction of vectors and their applications in solving basic problems	**Indicator:** B8.3.2.2.1 Add, subtract and find the scalar multiplication of vectors in the component form.	**Lesson:** 1 of 2
Performance Indicator: Learners can add, subtract and find the scalar multiplication of vectors in the component form.		**Core Competencies:** Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)
References: Mathematics Curriculum Pg. 153		

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Share performance indicators with learners and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Explain how vectors are added graphically. Use the 'tip-to-tail' method and demonstrate with examples. Allow learners to follow along with their own vectors on graph paper. Introduce the concept of vector addition and subtraction in component form. Demonstrate how to add and subtract the 'i' (horizontal) and 'j' (vertical) components separately. Example: Add the following vectors A = $\binom{3}{2}$ and vector B = $\binom{2}{4}$ = $\binom{3}{2}$ + $\binom{2}{4}$ = $\binom{3+2}{2+4}$ = $\binom{5}{6}$ Example: Subtract A=$\binom{5}{7}$ and B=$\binom{3}{4}$ = $\binom{5}{7}$ - $\binom{3}{4}$ = $\binom{5-3}{7-4}$ = $\binom{2}{3}$ Explain scalar multiplication. Show how multiplying a vector by a scalar affects both the magnitude and direction of the vector. Provide learners with practice problems involving vector addition, subtraction, and scalar multiplication. Work through these problems as a class, demonstrating each step and checking for understanding. Example: if p=$\binom{-1}{2}$, q=$\binom{4}{3}$, and r=$\binom{3}{-2}$, find i. 3q-2p ii. r-3p iii. q-p=2r <u>solution</u> i. 3q-2p = 3$\binom{4}{3}$ - 2$\binom{-1}{2}$ = $\binom{3x4}{3x3}$ - $\binom{-2x-1}{-2x2}$ = $\binom{12}{9}$ - $\binom{2}{-4}$	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	$= \begin{pmatrix} 12-2 \\ 9-(-4) \end{pmatrix} = \begin{pmatrix} 10 \\ 13 \end{pmatrix}$ ii. r-3p = $\begin{pmatrix} 3 \\ -2 \end{pmatrix} - 3\begin{pmatrix} -1 \\ 2 \end{pmatrix} = \begin{pmatrix} 3 \\ -2 \end{pmatrix} - \begin{pmatrix} 3x-1 \\ -3x2 \end{pmatrix} = \begin{pmatrix} 3 \\ -2 \end{pmatrix} - \begin{pmatrix} -3 \\ -6 \end{pmatrix} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$ Encourage questions and be sure to address any misconceptions or difficulties learners may have with the process. Give learners additional problems to work on individually.	
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: B8.3.2.2 Demonstrate understanding of addition and subtraction of vectors and their applications in solving basic problems	**Indicator:** B8.3.2.2.2 Demonstrate understanding of vector equality.	**Lesson:** 1 of 2
Performance Indicator: Learners can demonstrate understanding of vector equality.	**Core Competencies:** Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)	
References: Mathematics Curriculum Pg. 153		

Phase/Duration	Learners Activities	Resources
PHASE 1: **STARTER**	Revise with learners on the previous lesson. Share performance indicators with learners and introduce the lesson.	
PHASE 2: **NEW LEARNING**	Draw vectors on the board that are equal but in different positions in the plane. Show learners how even though their starting points differ, their lengths (magnitudes) and directions are the same, thus they are equal. Explain the properties of equal vectors, that is, if vector A = vector B, then they have the same i and j components. Meaning Ai = Bi and Aj = Bj. Also, they have the same magnitude and direction. Explain that vector equality is transitive (if A = B and B = C, then A = C), reflexive (A = A), and symmetric (if A = B, then B = A). Let us consider A= $\binom{1}{2}$, B=$\binom{1}{2}$, C=$\binom{1}{2}$ 1. Transitive: we can say that A=B since both have the same components. Similarly, B=C for the same reason. Using transitivity, A=C 2. Reflexivity: let's consider the vector- D=$\binom{3}{4}$ D=D since a vector is always equal to itself. 3. Using vectors A and B in the first example Since A=B. It's also true that B=A Discuss how these properties are similar to normal number equality, thus emphasizing the power and convenience of the vector notation. <u>Assessment</u> 1. Given the vectors X=$\binom{4}{-1}$, Y=$\binom{4}{-1}$, Z=$\binom{7}{2}$	Counters, bundle and loose straws base ten cut square, Bundle of sticks

	If **X**=**Y** and **Y**≠**Z**, can you determine the relationship between **X** and **Z**? 2. Consider the vector: P=$\begin{pmatrix}-3\\4\end{pmatrix}$. Is **P** equal to itself? 3. Given the two vectors: M=$\begin{pmatrix}2\\0\end{pmatrix}$, N=$\begin{pmatrix}2\\0\end{pmatrix}$ If **M**=**N**, can you deduce the relationship between **N** and **M**?	
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.	