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BASIC 8

WEEKLY LESSON PLAN – WEEK 5

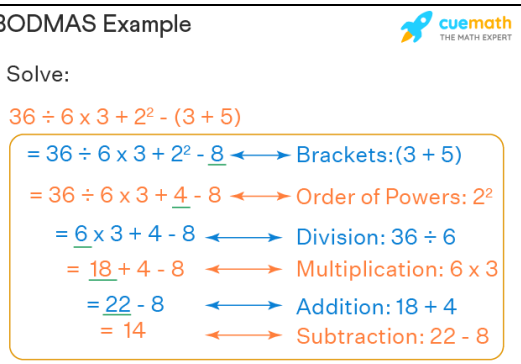
Strand:	Number		**Sub-Strand:**	Fractions, Decimals and Percentages	
Content Standard:	B8.1.3.1 Apply the understanding of operation on fractions to solve problems involving fractions of given quantities and round the results to given decimal and significant places.				
Indicator (s)	B8.1.3.1.1 Review fractions and solve problems involving basic operations on fractions B8.1.3.1.2 Add and/or subtract, multiply and/or divide given fractions, by using the principle of the order of operations including the use of the (the rule of BODMAS or PEMDAS) rule, and apply the understanding to solve problems B8.1.3.1.3. Review word problems involving basic operations on fractions and related concepts		**Performance Indicator:** Learners can solve word problems involving fractions.		
Week Ending	28-07-2023				
Class	B.S.8	**Class Size:**		**Duration:**	
Subject	Mathematics				
Reference	Mathematics Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Charts, Poster, Pictures.		**Core Competencies:**	• Analyze and make distinct judgment about viewpoints expressed in an argument • Ability to effectively define goals towards solving a problem	
DAYS	**PHASE 1 : STARTER**		**PHASE 2: MAIN**	**PHASE 3: REFLECTION**	
MONDAY	Review Learners knowledge on the concept of "Fraction".		1. Demonstrate on how to solve basic operations with fractions 2. Assist Learners to practice solving examples of basic operations with fractions. 3. Discuss with Learners on examples of word problem statements involving fractions. **Fraction Operations**	Learners in small groups to discuss to add, subtract, multiply and divide fractions.	

		To **add (or subtract)** two fractions : 1) Find the least common denominator . 2) Write both original fractions as equivalent fractions with the least common denominator. 3) Add (or subtract) the numerators. 4) Write the result with the denominator. **Example 1:** Add 13+37 . The least common denominator is 21 . 13+37=1 · 73 · 7+3 · 37 · 3 =721+921 =162113+37=1 · 73 · 7+3 · 37 · 3 =721 +921 =1621 To **multiply** two fractions: 1) Multiply the numerator by the numerator. 2) Multiply the denominator by the denominator. For all real numbers a,b,c,d(b≠0,d≠0) ab·cd=acbd **Example 2:** Multiply 14·56 . 14·56=1 · 54 · 6 =52414·56=1 · 54 · 6 =524 To **divide** by a fraction, multiply by its reciprocal . For all real numbers a,b,c,d(b≠0,c≠,d≠0) ab÷cd=ab·dc=adbc **Example 3:** Divide 34÷57 34÷57=34·75 =3 · 74 · 5 =212034÷ 57=34·75 =3 · 74 · 5 =2120 Mixed numbers can be written as an improper fraction and an improper fraction can be written as a mixed number. **Example 4:** Write 725 as an improper fraction. 725=71+25 =7 · 51 · 5+25 =355+25 =375725=71+25 =7 · 51 · 5+25 =355+2 5 =375	

		Example 5: Write 117 as a mixed number in simple form. 117=11÷7=1 R 4117=11÷7=1 R 4 Therefore, 117=147 A fraction is in lowest terms when the numerator and denominator have no common factor other than 11. To write a fraction in lowest terms, divide the numerator and denominator by the greatest common factor . **Example 6:** Write 45,75 in lowest terms. 45 and 75 have a common factor of 15. 75=45 ÷ ,75 ÷ 15=35	
TUESDAY	Discuss the rules of "BODMAS" and "PEMDAS" with the Learners.	1. Assist Learners to use BODMAS to simplify whole number expressions with more than two operations. 2. Learners brainstorm to use PEMDAS to simplify whole number expressions with more than two operations. BODMAS Rule **BODMAS rule** is an acronym that is used to remember the order of operations to be followed while solving expressions in mathematics. **BODMAS stands for** B - Brackets, O - Order of powers or roots, (in some cases, 'of'), D - Division, M - Multiplication A - Addition, and S - Subtraction. It means that expressions having multiple operators need to be simplified from left to right in this order only. First, we solve brackets, then powers or roots, then division or multiplication (whichever comes first from the left side of the expression), and then finally, subtraction	Reflect on the simplest way to remember the BODMAS rule.

		or addition, whichever comes on the left side. In this lesson, we will be learning about the BODMAS rule which helps to solve arithmetic expressions, containing multiple operations, like, addition (+), subtraction (-), multiplication (×), division (÷), and brackets ( ). What is BODMAS? BODMAS, which is referred to as the order of operations, is a sequence to perform operations in an arithmetic expression. Math is all about logic and some standard rules that make our calculations easier. So, BODMAS is one of those standard rules for simplifying expressions that have multiple operators. In arithmetic, an expression or an equation involves two components: • Numbers • Operators **Numbers** Numbers are mathematical values used for counting and representing quantities, and for making calculations. In math, numbers can be classified as natural numbers, whole numbers, integers, rational numbers, irrational numbers, real numbers, complex numbers, and imaginary numbers.	

		Operators or Operations An operator is a character that combines two numbers and produces an expression or equation. In math, the most common operators are Addition (+), Subtraction (-), Multiplication (×), Division (÷). For mathematical expressions or equations, in which only a single operator is involved, finding the answer is fairly simple. In the case of multiple operators, finding a solution becomes a little trickier! Let us understand this with an example. Jenny and Ron solved a mathematical expression 6 × 3 + 2 separately. The following are the two different methods by which Jenny and Ron solved the expression: Jenny's Method: 6 × 3 + 2 = 6 × 5 = 30, Ron's Method: 6 × 3 + 2 = 18 + 2 = 20. As we can observe, Jenny and Ron got different answers. In mathematics, we know that there can only be one correct answer to this expression. How to decide who is correct? In such cases, we use **BODMAS** to find the correct answer. Let us look at the example given below to get an idea of how BODMAS works:	



Bodmas Examples

Let us understand this using BODMAS examples.

Example 1: Simplify the expression using BODMAS.

10 + (5 × 3 + 2)

Solution: Let us solve 10 + (5 × 3 + 2) step by step.

- Step 1: We need to solve the brackets first. So, this will be 10 + (15 + 2)
- Step 2: This will result in 10 + 17 = 27

Example 2: Simplify the expression using BODMAS.

15 + (30 ÷ 2)

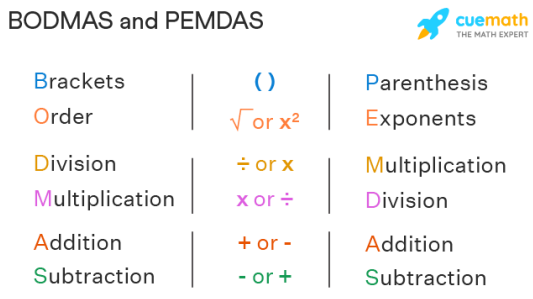
Solution:

Let us solve 15 + (30 ÷ 2) step by step.

- Step 1: We need to solve the brackets first. So, 15 + (30 ÷ 2) = 15 + 15
- Step 2: This will result in 15 + 15 = 30

BODMAS Full Fm

		The BODMAS rule is used to evaluate mathematical expressions and to deal with complex calculations in a much easier and standard way. **BODMAS Meaning** According to the BODMAS rule, to solve any arithmetic expression, we first solve the terms written in brackets, and then we simplify the exponential terms, or solve for the operation 'of', which means multiplication, and move ahead to division and multiplication operations, and then, in the end, work on the addition and subtraction. Following the order of operations in the BODMAS rule, always results in the correct answer. Simplification of terms inside the brackets can be done directly. This means we can perform the operations inside the bracket in the order of division, multiplication, addition, and subtraction. If there are multiple brackets in an expression, all the same types of brackets can be solved simultaneously. For example, (14 + 19) ÷ (13 - 2) = 33 ÷ 11 = 3. Observe the table given below to understand the terms and operations denoted by the BODMAS acronym in the proper order. • It should be noted that when we have all the 3 types of brackets, we start solving from the innermost brackets/parenthesis	

		( ), followed by the curly braces{}, and then the square brackets [ ]. • Another point to be remembered is that for the letter 'O', we use 'Order of Powers or Roots', however, in some cases, where 'of' is given, we solve 'of' which means multiplication. BODMAS or PEMDAS BODMAS and PEMDAS are two acronyms that are used to remember the order of operations. The BODMAS rule is almost similar to the PEMDAS rule. There is a difference in the abbreviation because certain terms are known by different names in different countries. While using the BODMAS rule or the PEMDAS rule we should remember that when we come to the step of division and multiplication, we solve the operation which comes first from the left side of the expression. The same rule applies to addition and subtraction, that is, we solve that operation that comes first on the left side. 	

When to Use BODMAS?

BODMAS is used when there is more than one operation in a mathematical expression. There is a sequence of certain rules that needs to be followed when using the BODMAS method. This gives a proper structure to produce a unique answer for every mathematical expression.

Conditions to follow:

- If there is any bracket, open the bracket, then add or subtract the terms. a + (b + c) = a + b + c, a + (b - c) = a + b - c
- If there is a negative sign just open the bracket, and multiply the negative sign with each term inside the bracket. a - (b + c) ⇒ a - b - c
- If there is any term just outside the bracket, multiply that outside term with each term inside the bracket. a(b + c) ⇒ ab + ac

Easy Ways to Remember the BODMAS Rule

The simple rules to remember the BODMAS rule are given below:

- Simplify the brackets first.
- Solve all exponential terms.
- Perform division or multiplication (go from left to right)

		• Perform addition or subtraction (go from left to right)	
THURSDAY	Discuss with Learners on examples of real life problems involving Fractions.	1. Demonstrate on solving fraction word problems of addition, subtraction and multiplication. 2. Learners brainstorm to calculate the perimeter and area of geometric shapes involved in a word problem. 3. Assist Learners to solve examples of the various categories of fraction word problems. **Fraction Word Problems using Algebra** ***Example:*** 2/3 of a number is 14. What is the number? Solution: Step 1: Assign variables : Let *x* = number Step 2: Solve the equation $14 = \frac{2}{3}x$ Isolate variable *x* $x = 14 \times \frac{3}{2} = 21$ ***Answer:*** The number is 21. ***Example:*** The numerator of a fraction is 3 less than the denominator. When both the numerator and denominator are increased by 4, the fraction is increased by fraction. **Solution:** Let the numerator be x, then the denominator is x + 3, and the fraction is xx+3+3 When the numerator and denominator are	Through questions and answers, conclude the lesson. **Exercise;** 1. Martha spent $\frac{4}{9}$ of her allowance on food and shopping. What fraction of her allowance had she left? 2. $\frac{3}{5}$ of a group of children were girls. If there were 24 girls, how many children were there in the group? 3. Sam had 120 teddy bears in his toy store. He sold $\frac{2}{3}$ of them at $12 each. How much did he receive?

		increased by 4, the fraction is x+4x+7 x+4x+7−xx+3=1277 $77(x + 4)(x + 3) – 77x(x+7) = 12(x + 7)(x + 3)$ $77x^2 + 539x + 924 – 77x^2 – 539x = 12x^2 + 120x + 252$ $12x^2 + 120x – 672 = 0$ $x^2 + 10x – 56 = 0$ $(x – 4)(x + 14) = 0$ x = 4 (negative answer not applicable in this case) ***Answer:*** The original fraction is 47 **How to solve Fraction Word Problems using Algebra?** Examples: (1) The denominator of a fraction is 5 more than the numerator. If 1 is subtracted from the numerator, the resulting fraction is 1/3. Find the original fraction. (2) If 3 is subtracted from the numerator of a fraction, the value of the resulting fraction is 1/2. If 13 is added to the denominator of the original fraction, the value of the new fraction is 1/3. Find the original fraction. (3) A fraction has a value of 3/4. When 14 is added to the numerator, the resulting fraction has a value equal to the reciprocal of the original fraction, Find the original fraction. • **Show Step-by-step Solutions** **Algebra Word Problems with Fractional Equations** Solving a fraction equation that appears in a word problem Example: One third of a number is 6 more than one fourth of the number. Find the number. • **Show Step-by-step Solutions** **Fraction and Decimal Word Problems** How to solve algebra word problems with fractions and decimals? Examples:	

		(1) If 1/2 of the cards had been sold and there were 172 cards left, how many cards were printed? (2) Only 1/3 of the university students wanted to become teachers. If 3,360 did not wan to become teachers, how many university were there? (3) Rodney guessed the total was 34.71, but this was 8.9 times the total. What was the total?	

Name of Teacher: ***School:*** ***District:***