

**MATATAG**

Bansang Makabata



Batang Makabansa



BAGONG PILIPINAS

School
Logo

Name of School:		Quarter:	4th Quarter
Grade Level & Section:	Grade 7	Week:	Week 3 Day 1
Subject:	MATHEMATICS	Date and Time:	
Topic:		Teacher:	

I. CONTENT, STANDARDS AND LEARNING COMPETENCIES		ANNOTATIONS
A. CONTENT STANDARDS	The learners should have knowledge and understanding of the solution of simple equations.	
B. PERFORMANCE STANDARDS	By the end of the quarter, the learners are able to solve simple equations.	
C. LEARNING COMPETENCIES	Learning Competency The learners... 1. solve simple equations represented by bar models to find unknowns; 2. illustrate the properties of equality; and	
D. LEARNING OBJECTIVES		
I. CONTENT		
Modeling Simple Equation using Bar Models		

II. LEARNING RESOURCES

A. REFERENCES

CueMath. (2024, January 15). Properties of equality. Cuemath.
<https://www.cuemath.com/algebra/properties-of-equality/>

National Repository of Online Courses (2023, December 17). Solving one-step equations using properties of equality. LibreTexts Mathematics.
[https://math.libretexts.org/Bookshelves/Applied_Mathematics/Developmental_Math_\(NROC\)/10%3A_Solving_Equations_and_Inequalities/10.01%3A_Solving_Equations/10.1.01%3A_Solving_One-Step_Equations_Using_Properties_of_Equality](https://math.libretexts.org/Bookshelves/Applied_Mathematics/Developmental_Math_(NROC)/10%3A_Solving_Equations_and_Inequalities/10.01%3A_Solving_Equations/10.1.01%3A_Solving_One-Step_Equations_Using_Properties_of_Equality)

Orines, F. B., et al. (2012). Next century mathematics 7. Quezon City, Philippines

Oronce, O. A., & Mendoza, M. O. (2010). E-math: Worktext in mathematics. Manila, Philippines

B. OTHER LEARNING RESOURCES

III. TEACHING AND LEARNING PROCEDURE

BEFORE/PRE-LESSON PROPER

ACTIVATING PRIOR KNOWLEDGE

Short Review

Fact or Bluff. Write Fact if the statement is true and Bluff if the statement is false.

1. An algebraic expression is an expression that is made up of variables and constants along with algebraic operations (addition, subtraction, multiplication, and division).
2. The mathematical statement in which two expressions are set equal is an integer.
3. The pie model is a tool that helps us visualize the given math problem using rectangles or bars.
4. A variable is a letter or symbol that represents an unknown number.

This short review is all terms related to their previous lesson in which the learners should fully understand the meaning of each terms which are needed in the other lessons they will have. The teacher may ask the learners to have the activity thumbs up or thumbs down to

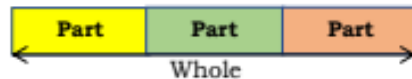
	5. Expressions are made up of terms and the number of terms in each expression in an equation.	answer the Fact or Bluff.
LESSON PURPOSE/INTENTION	Key Terms: 1. Bar Model: A visual representation used to solve algebraic equations by representing quantities as bars or rectangles, helping students understand the relationships between numbers and operations. 2. Equation: A mathematical sentence containing an equal sign (=) that shows the relationship between two expressions. 3. Variable: A symbol, often a letter, used to represent an unknown number in an equation. 4. Expression: A mathematical phrase that does not have an equal sign. It can consist of numbers, variables, and operators (e.g., addition, subtraction). What is a Bar Model? A bar model is a rectangular representation used to break down an algebraic equation into parts that are easier to understand. The model visually shows how different numbers and variables are related in the equation. Bar models are especially helpful in representing word problems and equations that involve addition, subtraction, multiplication, and division. Steps to Model Simple Equations Using Bar Models: 1. Identify the parts of the equation: First, examine the equation and identify the variable, constants, and operations. 2. Draw a bar for each part of the equation: Use bars of different lengths to represent the quantities. The length of each bar should be proportional to the value of the quantity it represents. 3. Set up the equation visually: The bars are arranged to reflect the relationship shown in the equation. 4. Solve the equation using the visual model: Once the model is drawn, solve the equation by manipulating the bars (i.e., subtracting or adding the lengths of the bars) to isolate the variable.	
LESSON LANGUAGE PRACTICE	Vocabulary: Modeling Simple Equations Using Bar Models	

	1.Bar Model: A visual tool used to represent the parts of an algebraic equation, where each quantity is depicted as a bar. The lengths of the bars are proportional to the values they represent. 2.Equation: A mathematical statement that shows the equality of two expressions, often containing a variable and constants. Example: $x+5=12x + 5 = 12x+5=12$. 3.Variable: A symbol, usually a letter (such as xxx or yyy), that represents an unknown number in an equation. 4.Constant: A fixed value that does not change in an equation. Example: In $x+5=12x + 5 = 12x+5=12$, 5 and 12 are constants. 5.Expression: A combination of numbers, variables, and operations (like addition or multiplication), without an equal sign. Example: $3x+23x + 23x+2$. 6.Solution: The value of the variable that makes the equation true. In the equation $x+5=12x + 5 = 12x+5=12$, the solution is $x=7x = 7x=7$. 7.Isolate the Variable: The process of solving an equation by getting the variable on one side of the equation by itself. 8.Total Bar: The bar in a bar model that represents the sum or total of the quantities involved in the equation. 9.Part Bars: The individual bars that represent different parts of the equation, such as the variable and the constants. 10.Proportional Representation: In a bar model, the length of each bar is proportional to the value it represents. The longer the bar, the greater the value. 11.Balance: The idea that both sides of an equation must be equal. In a bar model, this is shown by ensuring that the lengths of the bars match the equation's relationship. 12.Equation Set-Up: The process of translating a mathematical problem into an equation, and then representing it visually using bar models. 13.Inverse Operations: Operations used to reverse or undo another operation. For example, subtracting is the inverse of adding, and dividing is the inverse of multiplying.	
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DURING/LESSON PROPER		
READING THE KEY IDEA/STEM	Understanding Bar Models: 1. Visual Representation: In bar models, each quantity (whether it is a variable or constant) is represented by a rectangular bar. The lengths of the bars represent the values of those quantities. The idea is that the total value (represented by a longer bar) is broken down into smaller parts (shorter bars). 2. Equations and Bar Models: ○ For an equation like $x+5=12$, the bar representing x and the bar representing 5 are combined to equal the bar representing 12. By visually showing these parts, students can understand that in order to find x, they need to subtract 5 from the total of 12. ○ Similarly, for an equation like $2x=10$, two bars of equal length represent x, and the total value is 10. To find the value of x, the total bar is divided into two equal parts. Why Use Bar Models? 1. Simplifying Problem-Solving: Bar models allow students to break down complex equations into simpler parts. Instead of dealing with abstract algebraic symbols, students work with concrete visual representations that are easier to understand. 2. Helping Visualize the Equation: The bar model makes the equation visible, showing the relationship between the variable and constants in a way that helps students "see" the math. This is particularly useful when solving equations that involve addition, subtraction, multiplication, or division. 3. Developing Problem-Solving Skills: By using bar models, students practice solving equations step by step. This method reinforces their understanding of inverse operations (like subtraction and division) and how to manipulate the equation to isolate the variable. Steps in Solving Equations Using Bar Models: 1. Step 1 - Set Up the Model: Begin by drawing bars that represent the known quantities in the equation (like the constants) and the unknown variable. These bars	

	will be combined to show the total value in the equation. Step 2 - Manipulate the Model: Use the bars to manipulate the equation. For example, if the equation involves adding a constant to the variable, draw a longer bar for the total, and subtract the known bar to isolate the variable. Step 3 - Solve: Once the model is set up, perform the necessary operations (like subtraction or division) to solve for the variable. The length of the remaining bar represents the solution. Example: Let's consider the equation $x+4=10$ $x + 4 = 10$$x+4=10$. Step 1: Draw a bar for xxx and a bar for 4. You have two parts: one for xxx and one for 4, and together they make the total bar of length 10. Step 2: Subtract the bar of length 4 from the total bar of length 10. This will leave a bar representing the value of xxx, which is 6.	
DEVELOP NG and DEEPENING UNDERSTANDING OF THE KEY IDEA/STEM	Modeling Simple Equation using Bar Models Explicitation Let us say that you want to help with the daily expenses of your family. You were able to collect 68 photo cards that you want to trade. Your friend, Andrea, has seven times as many photo cards as yours. Andrea wants to share her photo cards equally between herself and you so that you can have many photo cards to be sold. How many cards do you have now? What do you think is the best way to solve the problem? Math problems can be visualized through bar modeling to represent known and unknown data. Bar models are one such tool that helps us visualize a given math problem using rectangles or bars. It is not a technique of computation, but rather a diagram that helps visualize the problem. A bar model is a way of using rectangles to represent numbers and operations in math problems. It can help you visualize the relationships between numbers and find the unknown values. Solving problems with bar modelling: A. Part-Part-Whole 	The teacher can expound the daily life application through other situations encountered by the learners in their daily lives. To introduce the lesson, provide a statement that will guide the learners to understand why they need to learn the concept. The teacher can give more examples to address the

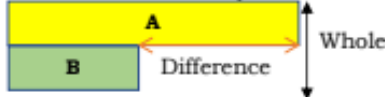
B. Equal Parts of a Whole



$$\begin{aligned}\text{Whole} &= \text{Part} \times \text{Number of Parts} \\ \text{Part} &= \text{Whole} \div \text{Number of Parts} \\ \text{Number of Parts} &= \text{Whole} \div \text{Part}\end{aligned}$$

C. Comparison

D. Part-Part-Whole and Comparison



$$\begin{aligned}\text{Whole} &= A + B \\ \text{Difference} &= A - B\end{aligned}$$

To further understand the illustration, here are some examples.

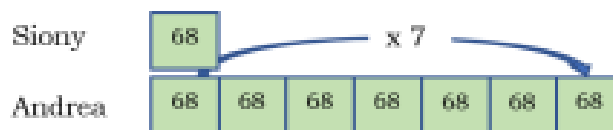
Worked Example

Example No. 1

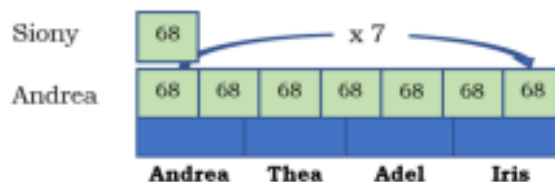
Siony was able to collect 68 photo cards which she can trade. Andrea has seven times as many cards as Siony. Andrea shares her cards equally between herself and her friends Thea, Adel, and Iris. How many cards do Andrea and Siony have now?

Solution:

A. Set up the bar model and label it carefully with the information given.



B. Make sure you have included all the information given in the problem.



C. Decide what the unknown is and how this can be calculated.

- Since Siony has 68 photo cards, multiply 68 by 7 to get the number of photo cards Andrea has.

$$68(7) = 476$$

- Andrea has **476 photo cards** at the start.

needs of other learners.

The teacher should prepare strips of paper in the shape of a rectangle so that they can show their learners how to do the bar method.

The students may visualize what is the essence of using the bar method.

Discuss thoroughly the differences of each bar modeling so the learners will be able to understand when to add, subtract, multiply, and divide.

- Divide 476 by 4, since it is divided equally to Andrea, Thea, Adel, and Iris.

$476 \div 4 = 119$ photo cards.

- Since Siony had 68 photocards before Andrea shared her photocards, then she has 187 photocards now.

$68 + 119 = 187$ photocards

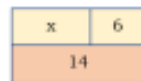
D. Complete the calculations to work out the answer to the problem.

- Andrea has 119 photo cards after sharing them with her friends.
- Siony has 187 photocards after Andrea shared her photo cards.

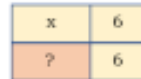
Example No. 2

Use the bar model to solve the given algebraic equation.

1. $x + 6 = 14$



Draw the bar model.



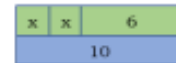
Subtract 6 from both sides.
 $x + 6 - 6 = 14 - 6$



$x + 0 = 8$
 $x = 8$

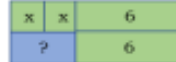
2. $2x + 6 = 10$

Draw the bar model.



$2x + 6 = 10$

Subtract 6 on both sides.



$2x + 6 - 6 = 10 - 6$
 $2x = 4$

Divide 2 on both sides.



$\frac{2x}{2} = \frac{4}{2}$
 $x = 2$

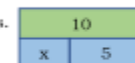
3. $x + 10 = 2x + 5$

Draw the bar model.



5

Subtract x on both sides.
 $x - x + 10 = 2x - x + 5$
 $0 + 10 = x + 5$



Subtract 5 on both sides.
 $10 - 5 = x + 5 - 5$
 $5 = x$



Checking:

$x + 6 = 14$

Substitute the value of x

$x = 8$

$8 + 6 = 14$

$14 = 14$

True

Checking:

$2x + 6 = 10$

Substitute the value of x

$x = 2$

$2(2) + 6 = 10$

$4 + 6 = 10$

$10 = 10$

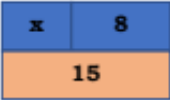
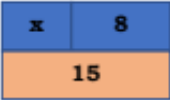
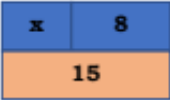
True

Checking:

$x + 10 = 2x + 5$

Substitute the value of x

$x = 5$

		$x + 10 = 2x + 5$ $5 + 10 = 2(5) + 5$ $15 = 10 + 5$ $15 = 15$ True																					
AFTER AFTER/POST-LESSON																							
MAKING GENERALIZATIONS AND ABSTRACTIONS	Worksheet Synthesis/Extended What you have learned In a one sheet of paper write something you understand about the lesson we discussed today.																						
EVALUATING LEARNING																							
ADDITIONAL ACTIVITIES FOR APPLICATION OR REMEDIATION (IF APPLICABLE)	A. It's Bar Time Complete the table below finding the value of the unknown using bar method. <table border="1"> <thead> <tr> <th>Equation</th><th>Bar Method</th><th>Value of the Unknown</th></tr> </thead> <tbody> <tr> <td>$x + 8 = 15$</td><td>  </td><td>$x = 7$</td></tr> <tr> <td>1. $5 + x = 10$</td><td></td><td></td></tr> <tr> <td>2. $2x + 10 = 30$</td><td></td><td></td></tr> <tr> <td>3. $2x - 5 = 13$</td><td></td><td></td></tr> <tr> <td>4. $2x + 12 = 28$</td><td></td><td></td></tr> <tr> <td>5. $3x - 4 = 2x + 5$</td><td></td><td></td></tr> </tbody> </table> B. Let's Try Solve the given algebraic equation by using the bar method. 1. If the entrance fee ticket in a park costs 15 pesos each, how many children buy the ticket if they pay 120 pesos?	Equation	Bar Method	Value of the Unknown	$x + 8 = 15$		$x = 7$	1. $5 + x = 10$			2. $2x + 10 = 30$			3. $2x - 5 = 13$			4. $2x + 12 = 28$			5. $3x - 4 = 2x + 5$			A. It's Bar Time $x = 5$ $x = 10$ $x = 9$ $x = 8$ $x = 9$ B. Let's Try - Eight children are buying the ticket. - Jess has 16 T-shirts in all.
Equation	Bar Method	Value of the Unknown																					
$x + 8 = 15$		$x = 7$																					
1. $5 + x = 10$																							
2. $2x + 10 = 30$																							
3. $2x - 5 = 13$																							
4. $2x + 12 = 28$																							
5. $3x - 4 = 2x + 5$																							

	2. Jess has 4 black T-shirts. She has 3 times as many white as black t-shirts. How many T-shirts does she have in all?	
REMARKS		
REFLECTION		

Prepared by:

Subject Teacher
Teacher

Reviewed by:

Master Teacher/Head