Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

3

Overview

This lesson plan covers teaching content for;

1. Understanding and defining open sentences.
2. Finding the missing umbers in open sentences.
3. Solving addition and subtraction problems in pen sentences.
4. Solving multiplication and division problems in open sentences.
5. Word problems in open sentences.

Objectives

Students should be able to;

1. Define an open sentence
2. Find a missing number in an open sentence
3. Solve given problems on open sentences involving the four basic operations.
4. Find missing numbers in quantitative aptitude diagrams drawn from open sentences.
5. Solve related quantitative reasoning problems.

Activity Starter/Instruction

1. Pupils are to understand and remember addition and subtraction facts very well. They should also be able to multiply and divide simple numbers.
2. Pupils are to remember that division is the inverse of multiplication and vice versa.
3. Before you start this lesson, ask the pupils what must be added to 6 to get 10.
4. Try this activity with many other addition facts, for example, facts to 20: 14 + 6 =20 therefore, 20 – 6 = 14.
5. Revise how to balance scales with the students.
6. Ten fish will balance a scale to the same level but only four have been put on the scale, how many fish need to be put on the scale for it to balance?
7. Explain the meaning of open sentences and relate it to the scale balance introduced earlier

Teacher Guide

Day 1/ Lesson 1: 15 Mins

1. Lead pupils to understand the different symbols used in representing unknowns, such as rectangular box, triangular box and circular box.
2. Alphabets are also used to represent unknowns. Lead them to determine the unknowns in the given examples.
3. Explain to students that open sentence is one in which the answer is either true or false, depending on what values are used. We have to solve the equation to know.
4. For example, "n is an even number" is open (could be true or false, depending on the value of n)
5. if n was 4 the sentence would be true, but if n was 5 the sentence would be false. But we didn't say what value n has!
6. The value we don't know is called a **variable** (also called an unknown)
7. In this example of an open sentence, x is a variable:

    $x + 3 = 8$

Materials Required

- White Board
- Blank sheets
- Pencils
- Shapes

Additional Resources

- https://za.pearson.com/content/dam/region-growth/africa/TeacherResourceMaterial/9781447978411_ngr
- https://www.mathsisfun.com/algebra/open-sentence
- https://www.math-only-math.com/equations.html
- http://www.algebra-class.com/open-sentences.html

Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

1. A statement of equality of two algebraic expressions which involves one or more literals (variables) is called an equation.
2. 3 + x = 7 is an equation.
3. The set of values of variables which makes the open sentence true is called the solution set.
4. Note: Every equation has two sides — L.H.S. (left-hand side) and R.H.S. (right-hand side).
5. An equation may contain any number of variables.

(a) x + 4 = 7

Solution:

x + 4 = 7

If x = 0, then 0 + 4 ≠ 7

If x= 1, then 1 + 4 ≠ 7

If x = 2, then 2 + 4 ≠ 7

If x = 3, then 3 + 4 = 7

Therefore, the solution set for the open sentence x + 4 = 7 is 3.

Guided Practice

Day 3/ Lesson 3: 30 Mins

Solutions to Open Sentences

1. To find the solution to an open sentence, we must find a number that we can substitute for the variable that will make the number sentence true.
2. Give the students an example, such as: solve $b + 5 = 18$.
3. Here, we must find that one number that we can substitute for the variable that will make the number sentence true.
4. Some students might guess or perform a mental calculation to say that 13 + 5 = 18.
5. To explain how we arrive at 13,

   b + 5 = 18

6. Subtract 5 from both sides of the equation (Whatever we do to the left hand side, we must do to the Right hand side of the equation)

   b + 5 – 5 = 18 – 5

   now on the left hand side, we have only b,

   ∴ b = 18 – 5 =13.

7. Check the answer by substituting 13 in the original equation
8. Generally, any operation we carry out to find the variable must be done such that only the variable stays on one side of the equation (preferably the L.H.S.)

Guided Practice

Day 4/ Lesson 4: 15 Mins

1. Allow pupils to interpret some given mathematical statements.
2. Lead them to write open sentences in the form of mathematical statements and then solve the equation formed.
3. Discuss the examples with the pupils and make sure they understand both methods for finding an unknown in division and multiplication problems.
4. Use examples to explain number sentences involving multiplications and divisions.
5. Solve for x if 36 ÷ 4 = x

   Since 36 ÷ 4 = 9, then x =9.
6. If 12 × a = 72, what is a?
7. We make only a stay on one side of the equation (i.e. make a the subject of the formula).

   $\therefore \frac{12 \times a}{12} = \frac{72}{12}$ Then we have:

   $a = \frac{72}{12} = 6.$

   Check to see if your answer is correct by replacing a with 6 and performing 12×6. This gives us 72. So we are correct.

Assessment Activity

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Give the student a series of open number sentences to solve.

What number can you put in this box to make this a true statement?

1. 7 + 6 = ☐ + 5
2. 8 + 4 = 5 + ☐
3. 2 × ☐ + 5 = 11

Assessment Activity

The teacher gives the students a word problem question:

1. If Lucy was given N1000 to buy chocolate worth N250, Cookies worth N200 and candies worth N150. How much change would she have left?

Summary

Review and Closing

1. Mark the exercise, taking note of where
2. individual pupils have not met the unit
3. objectives, in order to give these pupils
4. additional teaching input where required.

Review and Closing

1. The teacher revises how to fill in empty spaces/variables in an equation.
2. Remind the students that subtraction is the opposite/inverse of addition and multiplication is the inverse of division.
3. Therefore, when they see an addition equation, e.g. 7 + x =13,to solve for the variable, they have to subtract and vice versa.
4. Also, when they encounter multiplication equation, e.g. 5 * y = 30, they are to perform the inverse (division) to get y.