Patterns Within the Multiplication Table

Resource ID#: 42713   Primary Type: Formative Assessment

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Students are asked to find the missing numbers in a column of a multiplication table by using a pattern found within the table.

Subject(s): Mathematics

Intended Audience: Educators

Keywords: MFAS, pattern, multiplication, equation

Resource Collection: MFAS Formative Assessments

Grade Level(s): 3

Freely Available: Yes

Instructional Component Type(s): Formative Assessment

ATTACHMENTS

MFAS_PatternsWithinTheMultiplicationTable_Worksheet.docx

FORMATIVE ASSESSMENT TASK

Instructions for Implementing the Task

This task can be implemented individually or with small groups.

1. The teacher provides the student with the attached Patterns Within the Multiplication Table worksheet.

2. The teacher asks the student to look at the table to see if there are any patterns he or she can find that would help determine the missing numbers in the table.

3. The teacher should observe how the student determines the missing numbers.

4. After the student completes the table with the missing numbers, the teacher should ask the student to explain his or her strategy and thinking.

TASK RUBRIC

Getting Started

Misconception/Error

The student relies on computation alone and cannot use patterns to find the missing numbers in the multiplication table.

Examples of Student Work at this Level

The student attempts to determine the missing numbers but uses multiplication instead of recognizing a pattern within the table. For example, the student uses direct modeling to find the product of the factors along the first row and column. The student may make computational errors and does not correct with teacher prompting.

Questions Eliciting Thinking

Can you multiply these numbers again for me?

Point to row three and column three and ask the student to tell you what he or she notices about the numbers in each.

Instructional Implications

Give the student the MFAS task Adding Odds and Evens (3.OA.4.9).

Have the student analyze addition and multiplication tables to find arithmetic patterns.

Moving Forward

Misconception/Error

The student is reluctant to see patterns within the multiplication table.

Examples of Student Work at this Level

The student correctly determines all of the missing numbers but skip counts to determine the numbers instead of using a pattern despite prompting from the teacher.

Questions Eliciting Thinking

Point to the column four and the row four, and ask the student to explain what he or she notices about the numbers in each. Then, ask the student if he or she can find a pattern that could help in finding the missing numbers.

Instructional Implications

Describe some arithmetic patterns in the multiplication table and challenge the student to find others.

Have the student practice finding and describing arithmetic patterns in an addition table.

Almost There

Misconception/Error

The student struggles to explain his or her observations.

Examples of Student Work at this Level

The student correctly determines all of the missing numbers in the table, and it is evident through teacher observation that the student used patterns in the multiplication table to determine the missing numbers. However, the student has trouble describing the patterns and explaining how he or she used them to find the missing numbers.

Questions Eliciting Thinking

Another student had to draw a picture and multiply to determine each missing number. Is there an easier and faster way to determine the missing numbers?

Instructional Implications

Model for the student how to determine and describe patterns within multiplication tables.

Provide opportunities for the student to explain his or her thinking to peers.

Got It

Misconception/Error

The student provides complete and correct responses to all components of the task.

Examples of Student Work at this Level

The student correctly finds all of the numbers using a pattern and explains that if you know 2 x 7 you also know 7 x 2. He or she may refer to the Commutative Property of multiplication.

Questions Eliciting Thinking

Are there any other patterns you notice within the multiplication table?

Why do you think there are patterns found within the multiplication table? Do you think this would also be true for division?

Instructional Implications

Have the student complete the MFAS task Decomposing Into Equal Addends (3.OA.4.9).

Challenge the student to explore and explain why the digits of the multiples of nine always sum to nine.

ACCOMMODATIONS & RECOMMENDATIONS

Special Materials Needed:

- Patterns Within the Multiplication Table worksheet

SOURCE AND ACCESS INFORMATION

Contributed by: MFAS FCRSTEM

Related Standards

Name	Description
MAFS.3.OA.4.9:	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.