

Guess my Rule - Multiplicative Tables

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Summary	Two children create secret rules for transforming input numbers. The teacher uses a doubling or tripling rule.
Goals	<ol style="list-style-type: none">1. Simple additive functions and their inverses.2. Learn mapping notation.3. Name the rules; use the name of the person who made up the rule.
Materials	Overheads, Handouts
Keywords	Full Class Discussion Interpretation of Tables Number Lines Production of Algebraic Expressions Production of Tables
Note	This class is very similar to lesson 3.18 – Guess My Rule – Tables. You can use either or both of these lessons.

Activity Plan:

Filling in a function table for 3 functions.

1. Completing a 3-Rule table [Whole Class]

This table will hold three different columns of output for three different rules that we use to operate on each input value.

Ask two students to volunteer. Encourage one of them to use an additive rule (for example, input + 3). The second student will always subtract a constant from the input (for example, input - 5). The teacher will use a rule to always double or triple the input (input x 2 or input x 3).

Show the overhead on Page 1 and together with the children fill out the table, computing the outputs from the input values suggested by them.

Make sure students understand that once they pick a rule, they need to use the same rule for the whole column of the table.

Make sure you also work from the outputs to compute the inputs. In a few cases, suggest a negative number as an input.

For the last row, ask children to suggest how to write an input that could represent any number and work with them on how to represent the outputs.

For each column, wait until they find the rule and write the rule at the bottom of the overhead (e.g.: $N \rightarrow N + 3$).

Use number lines (on Page 5) if the children need them to compute the outputs.

2. Handout

The students now take their turn at filling out the table in the handout (Page 2), presumably with some different values than those tried out in the class discussion.

It is important to note how they state the rules.

3. The Students' Descriptions of the Rules [Whole Class]

Spend a careful amount of time discussing how various children tried to capture the rules. Did any use N ? Did any only specify the change, e.g. 3, or -3?

Ask them to judge which descriptions would be easier to follow for a child who was not already familiar with the rules.

Discuss mapping notation for each of the rules. Use the person's name to identify which rule you are talking about.

Erica (Student 1): $K \rightarrow K + 7$

Matthew (Student 2): $P \rightarrow P - 5$

David (Teacher): $C \rightarrow C + C$ or $C \rightarrow C \times 2$

4. Discuss (if time) function notation [Whole Class]

On page 3 the "in" part is located between the parentheses. The name of the rule is before the parentheses.

The value is the "out" part.

	Out		
In			
<i>N</i>			

What is the first rule? _____

What is the second rule? _____

What is the third rule? _____

Name: _____ Date: _____

	Out		
In	Add 3 to the Input	Subtract 2 from the Input	Multiply the Input by 3
3			
7			
10			
	9		
		9	
			9
100			
101			
N			

What the first rule? _____

What is the second rule? _____

What is the third rule? _____

Rule 1 (3) =

Rule 2 (3) =

Rule 3 (3) =

Rule 1 (14)

Rule 2 (14)

Rule 3 (14)

**Overhead and Homework: Make Your Own Rule Using
Multiplication (Page 4)**

Name: _____ Date: _____

In	Out
100	
101	
10	
3	
6	
N	

What is your rule? _____

