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What's My Rule?

An Introduction to Functions

As the students move on to math in middle school, they will begin to learn about *functions*. This lesson introduces the concept of simple functions in a fun and very concrete way. The student is presented with a list of numbers, and then tries to figure out what the rule is to continue the list.

Grade Level:

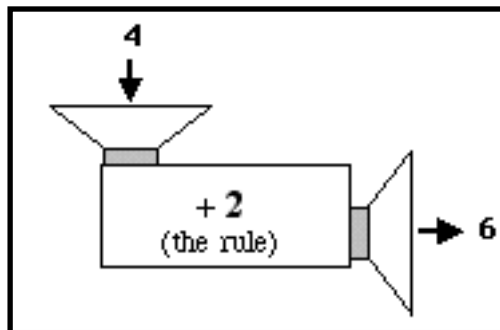
- Third to Sixth

Materials:

- Printout of (*What's My Rule Practice Sheet*)
- The (*What's My Rule1*) *Microsoft Excel* template

Before the Computer:

- Write these numbers on the board: (2, 4); (8, 10); (20, 22); (34, 36). Ask the question “In each pair of numbers, what do we do to the first number to get the second one?” (The rule is add 2.) Write (2, 6); (4, 12); (8, 24); (18, 54) on the board and pose the same question (the rule is multiply by 3.) Draw a picture of a “function box” (which contains the number going in, the rule, and the number coming out), and use it to illustrate these concepts. See the practice sheet for a more detailed explanation of the function box.
- Pass out the practice sheet (you can either copy it from page 96 or print it from the CD). You might want to make a transparency of the sheet and do the first function box whole group. Have the students work in pairs to complete the sheet.
- Demonstrate the template file with your computer hooked to a projector or TV screen. Explain to the students they will be looking at input and output numbers, and coming up with the rule this time!



On the Computer:

- Open the (*What's My Rule1*) *Microsoft Excel* template. There are three versions of the template: (*What's My Rule1*) is the easiest, (*What's My Rule2*) is a little more difficult, (*What's My Rule3*) is the hardest (this one is pretty tough and is designed for those students who need an extra challenge!).
- As you change the input number on the spreadsheet, notice the output number changes according to the rule in the function box. But what's the rule? That's for you to figure out!
- Change the input number at least five times for each function box and record both the input and output numbers in the spaces provided. Can you figure out the rules from your data? Type the rules in the cells provided.

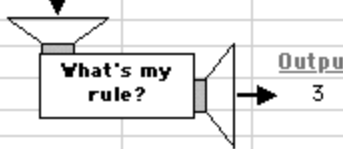
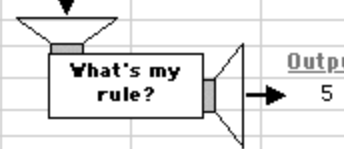
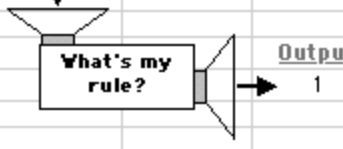
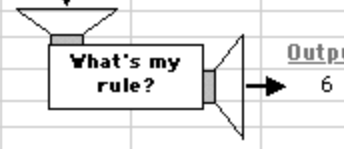
Extensions:

- Challenge students to come up with their own function boxes (rules) and try to stump their friends. If any of your students understand how to use formulas in the spreadsheet, they could alter the (*What's My Rule1*) template to demonstrate their functions.
- Pose the problem to the students: you have a choice of receiving \$2.00 a day for 15 days or receiving 1¢ the first day, which doubles everyday for the 15 days. Which would you rather get? Write down the daily accumulative amount of money for each scenario. What is the rule for each one?

What's My Rule?

An Introduction to Functions *(cont.)*

What's My Rule? Example

	A	B	C	D	E	F	G	H	I	J	K	L
1	What's My Rule?										Name	
2												
3	<ul style="list-style-type: none"> ● One definition of a function is to say <i>for any number you input, the rule determines exactly one output.</i> ● Look at the functions below. Change the input number and observe how the output number changes. Change the input number five times and record each output number in the table below the function box. ● See if you can determine the rule for the function, and record it in the space provided. 											
4												
5												
6												
7												
8	Input 2 ↓ 						Input 2 ↓ 					
9												
10												
11												
12												
13												
14												
15												
16												
17												
18	Input		Output									
19	1)	2	3									
20	2)	6	7									
21	3)	4	5									
22	4)	9	10									
23	5)	23	24									
24												
25	The rule for this function is:						The rule for this function is:					
26	add 1						add 3					
27												
28												
29												
30	Input 2 ↓ 						Input 2 ↓ 					
31												
32												
33												
34												
35												
36												
37												
38												
39												
40	Input		Output									
41	1)	2	1									
42	2)	6	5									
43	3)	7	6									
44	4)	16	15									
45	5)	23	22									
46												
47	The rule for this function is:						The rule for this function is:					
48	subtract 1						multiply by 3					
49												
50												