Input-Output

CCSS 3.OA.8, 4.OA.5

MATERIALS:

- Input-Output examples

The teacher is to think of a rule/function for converting one number (input) into another number (output). The students are going to guess the rule.

The teacher needs to first think of a function rule. (Examples of function rules are to the right. Gauge the function rules to the abilities of the students in the class.) Ask the students for ten input numbers. (The students can state any number, but you may want to limit the range the first time by keeping numbers between 1 and 20.) An example is on right.

The teacher puts in the first three output numbers.

If a student thinks they know the rule they can come up and write in an output number. If the number is correct it is left; if the number is incorrect the teacher erases the number. Do not let a student state the rule out loud yet — wait for other students to come up and add numbers. Once all the output numbers are filled in, have one student explain the rule and how they were able to figure it out. *Example: "I multiplied 4 x 12 and got 48, multiplied 2 x 12 = 24, and continue to apply the rule of multiplying by 12 to the other numbers."*

If students are having difficulty figuring out the output numbers, ask for suggestions on making it easier. One solution is to list the input numbers in numerical order.

NOTE: Playing this game in silence allows thinking time for all students. Once someone gives the rule, thinking will stop for all others.

Other Possible Rules:

N x N + 1 =

N x N + N =

3N - 2 =

EXAMPLE

Rule: N x 12 =

Give only the first three input numbers.
Italicized numbers are answers for teacher.

Input	Output
4	**48**
2	**24**
7	**84**
10	*120*
15	*180*
6	*72*
0	*0*
11	*132*
1	*12*
5	*60*

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Input/Output Examples

INPUT	OUTPUT
4	48
2	24
7	84
10	
15	
6	
0	
11	
1	
5	

(N x 12)

INPUT	OUTPUT
5	26
10	101
2	5
7	
20	
15	
4	
8	
1	
9	

(N x N + 1)

INPUT	OUTPUT
5	13
10	28
2	4
100	
7	
4	
5	
1	
9	
14	

(3N– 2)

INPUT	OUTPUT
9	90
3	12
6	42
298	
5	
12	
20	
10	
2	
4	

(N x N) + N

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