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# patterns and algebra

MATHEMATICS FOR YOUNG MINDS

Sample Activities

# Function Machine

*Children apply different rules to change numbers.*

Blackline Master 37 (page 117)

Counters



## Preparation

- Provide each child with a copy of Blackline Master 37.



## Activity

On the board draw a large function machine like the ones on the Blackline Master. Say, **This machine follows number rules. If you put a number into the machine it will change the number to match the rule.**

Write the rule **add 2**, and write **4** in the IN box. Ask, **What will come out of the machine?** Have children explain their answers and thinking. Check the answer by using counters. Repeat the function action with several different, greater starting numbers.

When children are familiar with the process ask them to write a different adding rule on each function machine picture. They then write a different IN number on each machine and exchange their page with a classmate. The children must then apply the rule to write the four OUT numbers that result.

Lead a class discussion on the results. Ask, **Who has a machine with “add 1” as a rule? What numbers did you write? Why?** and so on.



## Extension

To extend understanding repeat the activity but have children write a rule that applies to input and output numbers a classmate has written. Again, have children explain their thinking.

# Reverse the Rule

Children identify a rule, apply it, then reverse the rule.

Cards for numbers 3, 5, 6, and 8

Sticky tack

Counters



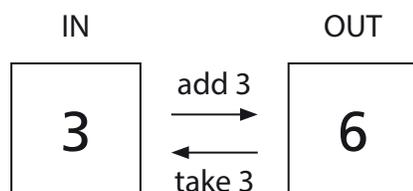
## Preparation

- Make cards for numbers 3, 5, 6, and 8.



## Activity

On the board, write **IN**, attach a card showing 3 below this, and draw an arrow pointing to the right (see below). To the right of the arrow, write **OUT** and attach a card showing 6. Ask, **What has changed? What is the change rule?** Write **add 3** above the arrow.



Draw a second arrow pointing left as shown above. Ask, **What is the rule for this arrow?** Elicit various ideas. Write **take 3**. Say, **Look at the first rule. What do you notice?** Bring out that the first rule has been reversed.

Remove the cards and attach 6 counters on the right side. Confirm the amount and ask, **What will be the IN number? Why?** Attach 3 counters on the left.

Repeat the activity to demonstrate 5 add 3 and then reinforce the reverse with counters. Then display and discuss a few examples for **add 2** and **take 2**. This time start with counters and move onto written numbers.