

3. Use the table of values in question 2a.

Draw pictures to show the relationship in the table.

4. Each table shows the input and output from a machine with two operations.

- Find the pattern rule that relates the input to the output.
- Use the pattern rule to find the missing numbers in the table.
- Use the patterns in the columns to check your answers.
- Predict the output when the input is 40. Check your prediction.

a)

Input	Output
5	21
6	24
7	27
?	30
9	?
10	?

b)

Input	Output
0	1
5	2
10	3
?	4
20	?
25	?



5. You may need Colour Tiles or counters, and dot paper.

- Use tiles, counters, or pictures to show the relationship in this table. Record your work.
- Write a pattern rule that relates the input to the output.
- Predict the output when the input is 9. Extend your pictures to check.
- Which input has an output of 28? Describe the strategy you used to find out.

Input	Output
1	6
2	8
3	10
4	12

6. a) Draw an Input/Output machine with two operations.

Choose two numbers and two operations for your machine.

b) Choose 5 input numbers. Find the output numbers.

c) Trade tables with a classmate.

Find the pattern rule that relates the input to the output.

Use this pattern to write the next 4 input and output numbers.

Reflect

When you look at an Input/Output table, what strategies do you use to identify the numbers and operations in the machine?



The output numbers increase by 10.
 This suggests the input numbers are multiplied by 10. Look at input 2.
 Multiply by 10: $2 \times 10 = 20$
 But the output is 13.
 We subtract 7 from 20 to get 13.

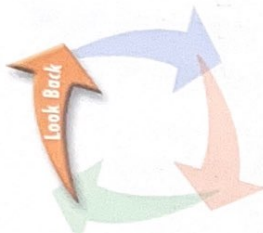


Check: Look at input 4.
 Multiply by 10: $4 \times 10 = 40$
 Subtract 7: $40 - 7 = 33$
 The output should be 23.
 This pattern rule does not work.

Try a different pattern.
 When the input increases by 2,
 the output increases by 10.
 So, when the input increases by 1,
 the output increases by $10 \div 2 = 5$.
 This suggests the pattern involves multiples of 5.
 Which two operations does Ben's machine use?

Use the operations in the machine to extend
 the pattern of the output numbers.
 Check that the rule is correct.

Input	Output
2	13
3	18
4	23
5	28
6	33



Practice

Choose one of the
Strategies

- Design an Input/Output machine for each table below.
 How did you decide which operations to use?

a)

Input	Output
2	7
4	15
6	23
8	31

b)

Input	Output
3	10
6	19
9	28
12	37

Reflect

Choose one part of question 1.
 Explain how you used a pattern to solve it.