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Learn About

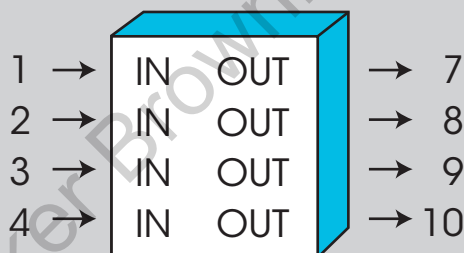
Using Algebra: Patterns

Number patterns follow *rules*. An IN and OUT box uses a number pattern. A number goes IN the box. A rule is followed. Then a new number comes OUT. The *rule* is the pattern that changes an IN number to an OUT number.

Find the rule. Look at each pair of IN and OUT numbers. Ask these questions:

- Is the OUT number less than or greater than the IN number?
- What pattern has been done to the IN number?

Look at the IN and OUT box. Try to find the rule.



Find the rule. The OUT numbers are greater than the IN numbers. A number has been added. Check each pair to find the number that is added.

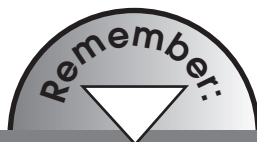
$$1 + 6 = 7$$

$$2 + 6 = 8$$

$$3 + 6 = 9$$

$$4 + 6 = 10$$

The pattern is **add 6**.



Number patterns follow rules. An IN and OUT box uses a number pattern. The *rule* is the pattern that changes the IN number to an OUT number.

Learn About

Using Algebra: Number Sentences

A **number sentence** has numbers and symbols. It has a +, −, × or ÷ sign. It has an =, < or >. Example: $2 + 3 = 5$

Some number sentences have a missing number. The box stands for the missing number. Example: $2 + \square = 5$

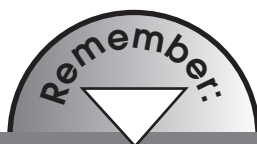
Use addition or subtraction to find the missing number.

$$2 + 3 = 5 \quad \text{OR} \quad 5 - 3 = 2$$

You can write a number sentence to solve a problem. Read the problem. Then read how to solve the problem.

Lin has 6 balls. All of the balls are purple or green. Lin has 4 purple balls. How many green balls does Lin have?

Question:	Answer:
What do you know?	There are 6 balls. There are 4 purple balls.
What do you need to find?	The number of green balls.
What should you do?	Add or subtract.
Use the numbers to write a number sentence. Use a box for the number you need to find.	$4 + \square = 6$ OR $6 - \square = 4$
Find the number.	$4 + 2 = 6$ and $6 - 2 = 4$ So, $\square = 2$.



A **number sentence** has numbers and symbols. It has a +, −, × or ÷ sign. It has an =, < or >. Some number sentences have a missing number. A box stands for the missing number.

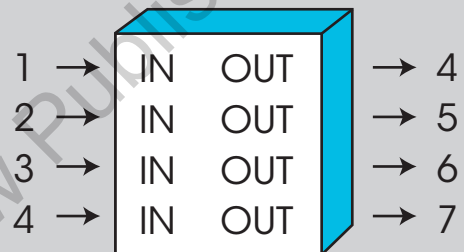
Read these sample problems.

Using Algebra

Susan and Jacob are friends.

They made an IN and OUT box.

This is the IN and OUT box they made.



1. What is the rule for the IN and OUT box?

- Ⓐ Add 1.
- Ⓑ Add 2.
- Ⓒ Add 3.
- Ⓓ Add 4.

2. Susan put in a 6. Which number came out?

- Ⓐ 8
- Ⓑ 9
- Ⓒ 10
- Ⓓ 11

Look at the answer choices for each question. Read why each answer choice is correct or not correct.

1. What is the rule for the IN and OUT box?

A Add 1.

This is not correct. $1 + 1 = 2$, not 4.

B Add 2.

This is not correct. $1 + 2 = 3$, not 4.

C Add 3.

This is correct. $1 + 3 = 4$.

D Add 4.

This is not correct. $1 + 4 = 5$, not 4.

2. Susan put in a 6. Which number came out?

A 8

This is not correct. The pattern is add 3, and $6 + 3 = 9$, not 8.

B 9

This is correct. The pattern is add 3, and $6 + 3 = 9$.

C 10

This is not correct. The pattern is add 3, and $6 + 3 = 9$, not 10.

D 11

This is not correct. The pattern is add 3, and $6 + 3 = 9$, not 11.

Lesson

1

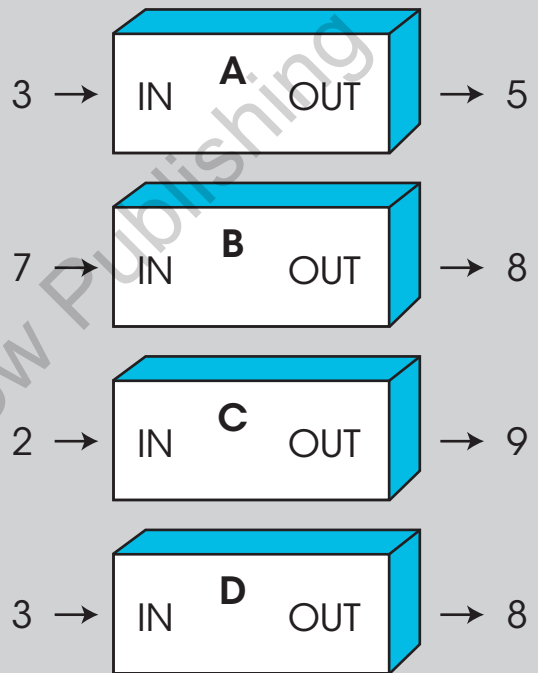
Read the passage.
Then do Numbers 1–5.

Molly's Maths Box

Molly made IN and OUT boxes.

They are addition boxes.

She showed them to her teacher.



1. Molly put a 3 into box A. Then she took a 5 out of the box. What number did she add to 3?

- Ⓐ 2
- Ⓑ 3
- Ⓒ 5
- Ⓓ 8

2. Molly put a 7 into box B. Then she took an 8 out of the box. What number did she add to 7?

- Ⓐ 9
- Ⓑ 8
- Ⓒ 2
- Ⓓ 1

3. The teacher put a 2 into box C.
Then he took a 9 out of the box.
What number did he add to 2?

- Ⓐ 6
- Ⓑ 7
- Ⓒ 9
- Ⓓ 11

4. The teacher put a 3 into box D.
Then he took an 8 out of the box.
What number did he add to 3?

- Ⓐ 6
- Ⓑ 5
- Ⓒ 4
- Ⓓ 3

5. The teacher made a new box. He put a 2 in the box and took out a 4. He put a 3 in the box and took out a 6. He put a 5 in the box and took out a 10. What did the box do to each number that went in? Show your work in the space below. Remember to check your solution.

Write your solution.

Explain how you found your solution.
