0533CH13

Find the hidden numbers.

36
72
28
48

Numbers put in this box get multiplied by a number and come out.

(a) Can you guess the multiplier if you see the 4 numbers coming out of the box?

(b) Is there more than one possible multiplier?

(c) What numbers might have been put inside the box?

Share your thoughts in the class.

You can also play this game with your friends.

The multipliers 1, 2, and 4 that you found above are the **factors** of the numbers that have come out of the box, that is, 28, 36, 48, and 72. In fact, these are the common factors of all the numbers. The numbers 28, 36, 48, and 72 are **multiples** of 1, 2 and 4.

The product of two or more factors gives a multiple.

A number, when arranged in an array, shows the factors of that number. Are there other numbers that are factors of 15? Try to make other arrays for the number 15.
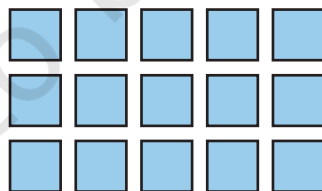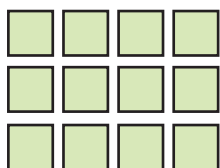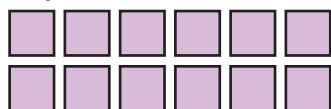
$3 \times 5 = 15$

Factors   Multiple

Let us make arrays for the number 12.

$3 \times 4 = 12$

$2 \times 6 = 12$

$1 \times 12 = 12$

1, 2, 3, 4, 6, and 12 are all factors of 12. Each of the numbers can divide 12 completely. 12 is a multiple of these numbers.

Do you see why 12 is a multiple of 1, 2, 3, 4, 6, and 12?

$$2 \times \underline{\quad} = 12 \qquad 3 \times \underline{\quad} = 12$$
$$12 \times \underline{\quad} = 12 \qquad 1 \times \underline{\quad} = 12$$

The number itself is always a multiple of itself.

Let Us Do

Make different arrays for the following numbers. Identify the factors in each case.

(a) 10

(b) 14

(c) 13

(d) 20

(e) 25

(f) 32

(g) 37

(h) 46

(i) 54

Numbers like 13 and 37 are called prime numbers. Why?

Animal Jumps

A rabbit takes a jump of 4 each time. A frog takes a jump of 3 each time. Use the number line to figure out the numbers they will both touch. If the rabbit and the frog start from 0, the numbers both of them will touch are called the **common multiples** of 3 and 4.
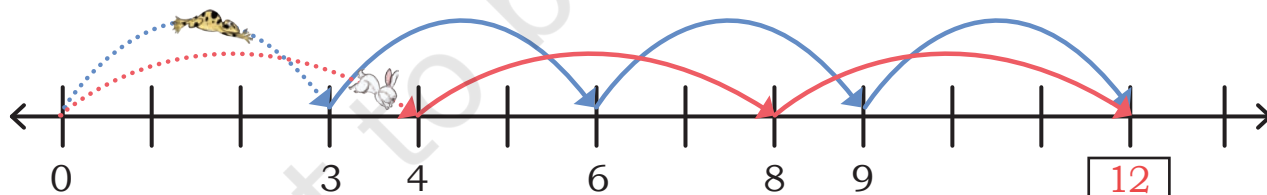
12 is the first common multiple of 3 and 4. What are some other common multiples of 3 and 4? You can continue the number line or take help from the times tables of 3 and 4.

What do you notice about the common multiples of 3 and 4? Discuss in class.

A spider takes a jump of 3 every time. A grasshopper takes a jump of 6 each time. Use the number line to find the common multiples of 3 and 6.
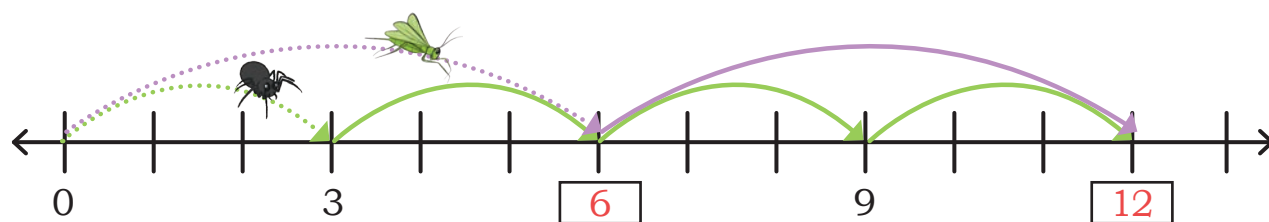
6 and 12 are two common multiples of 3 and 6. You can continue the pattern to find more common multiples. What do you notice about the common multiples of 3 and 6? Discuss.

Let us write the multiples of two numbers— 4 and 6.

Multiples of 4— 4, 8, (12), 16, ...

Multiple of 6— 6, (12), 18, ...

12 and 24 are two of the common multiples of 4 and 6. List a few more.

Let Us Do

1. Find 5 common multiples of the following pairs of numbers.

    (a) 2 and 3   (d) 3 and 9   (f) 8 and 12
   (b) 5 and 8   (e) 5 and 10   (g) 6 and 8
   (c) 2 and 4   (f) 9 and 12   (h) 6 and 9

What do you notice about the common multiples of different pairs of numbers? Discuss in class.

2. Food is available at the end of a cobbled road. Robby, the rabbit, takes a jump of 4 each time. Deeku, the deer, takes a jump of 6 each time. They both start at 0. Will both Robby and Deeku reach the food? Who will reach first? How do you know? Explain your answer.
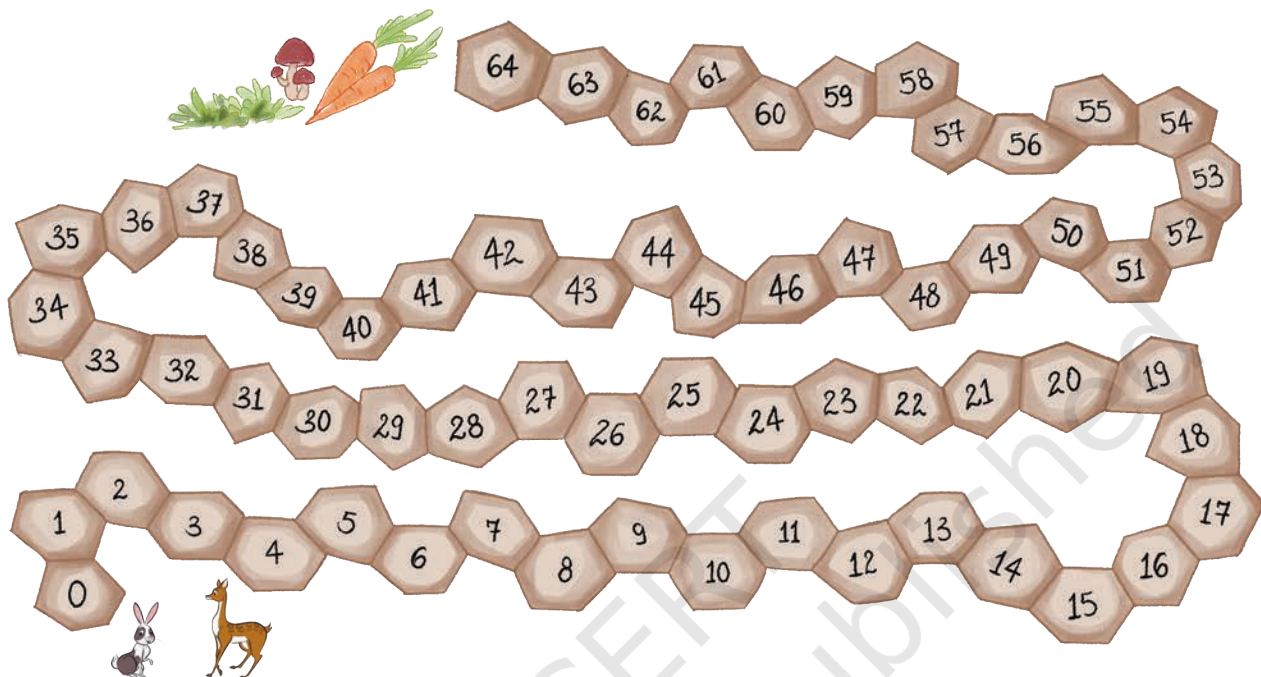
3. Mowgli's friends live along the trail on the marked places below. Which of his friends will he be able to visit, if he jumps by 2 steps starting from 0?
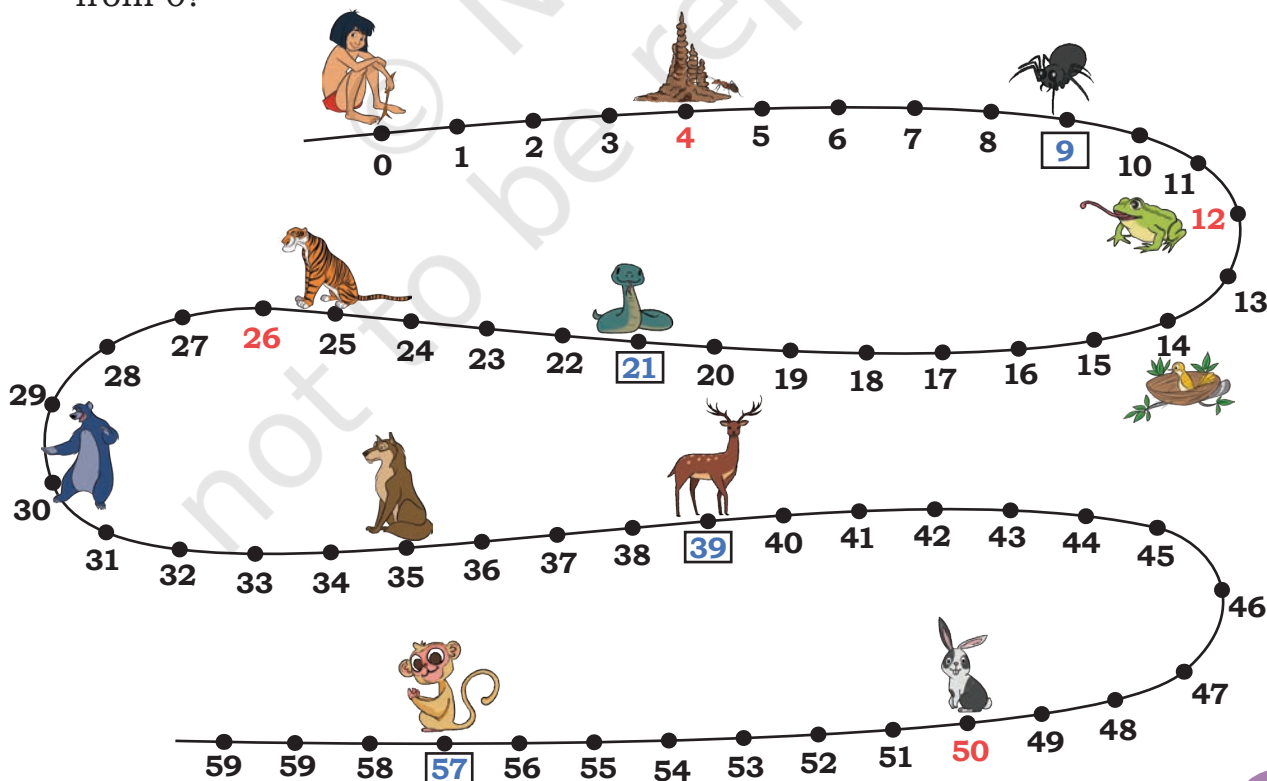
Did Mowgli meet the ant, frog, bird and the rabbit? Notice their positions— 4, 12, 14, and 50. 2 is a common factor of these numbers.

Which of his friends will he be able to meet if he jumps by 3 steps?

3 is a common factor of the numbers 9, 21, 39, and 57.

Which numbers will he touch if he jumps by 5 steps?

_____.

5 is a common factor of the numbers _____.

Which numbers will he touch if he jumps by 10 steps?

_____.

10 is a common factor of the numbers _____.

A **common factor** of two or more numbers exactly divides each the numbers.

4. Let us find some common factors of the numbers 24 and 36. Note that all jumps in the following questions start from 0.

   (a) Can we jump by 2 steps at a time to reach both 24 and 36? Yes/ No. 2 is/is not a common factor of 24 and 36.

   (b) Can we jump by 3 steps at a time to reach both 24 and 36? Yes/ No. 3 is/is not a common factor of 24 and 36.

   (c) Can we jump by 4 steps at a time to reach both 24 and 36? Yes/ No. 4 is/is not a common factor of 24 and 36.

   (d) What other jumps can we take to reach both 24 and 36?

   (e) How many common factors can you find for 24 and 36? List them.

   (f) What about jumping by 1 step each time to reach both 24 and 36?

5. What are the common factors of 12 and 13? ←

The number itself and 1 are always factors of any number

6. Find which of the following numbers can be reached by jumps of 4 steps?
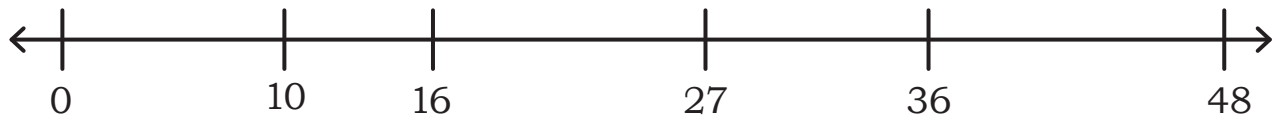
   4 is the common factor of the numbers _____.

7. Find the common factors of the following pairs of numbers.

   (a) 12 and 16   (d) 2 and 9   (f) 20 and 5
   (b) 8 and 12   (e) 3 and 5   (g) 9 and 21
   (c) 4 and 16   (f) 12 and 15   (h) 6 and 27

What do you notice about the common factors of different pairs of numbers. Discuss in class.

8. State whether the following statements are true (T) or false (F).

   (a) Factors of even numbers must be even.
   (b) Multiples of odd numbers cannot be even.
   (c) Factors of odd numbers cannot be even.
   (d) One of the common multiples of two consecutive numbers is their product.
   (e) The only common factor of any two consecutive numbers is 1.
   (f) 0 cannot be a factor of any number.

9. Sher Khan, the tiger, goes hunting every 3rd day. Bagheera, the panther, goes hunting every 5th day. If both of them start on the same day, on which days will they be hunting together?

10. (a) In the trail shown earlier, Sher Khan's house is on number 25 and that of Baloo the bear is on number 30. Mowgli wants to meet his friend Baloo the bear but wants to avoid Sher Khan's house. How long (in steps) could each jump be?

    (b) What number of jumps (in steps) he could choose so that he can meet both Kaa, the snake, at 21 and Akela, the wolf, at 35?

11. Sort the following numbers into those that are—
    (a) divisible by 2 only
    (b) divisible by 5 only
    (c) divisible by 10 only
    (d) divisible by 2, 5, and 10.

90	22	38	30	75
45	66	78	62	40
84	56	25	95	55

Numbers divisible only by 2

Numbers divisible only by 5

Numbers divisible by 2, 5, and 10

Numbers divisible only by 10