7 - 1 Whole Numbers

Even and Odd Numbers (1)

Example A classroom of students is split into two teams. Each student draws a numbered card to determine which team they belong to.

Red Team 1 3 5 7 .....

White Team 2 4 6 8 .....

Even numbers are divisible by 2 and odd numbers are not divisible by 2.

1. A student draws a card with a 10 on it. Which team does he belong to? — White team
2. A student draws a card with an 11 on it. Which team does she belong to? — Red team
3. What kind of numbers are on the red team? — Odd numbers
4. What kind of numbers are on the white team? — Even numbers

A group of children is split into two teams. Each child draws a numbered card to determine which team they belong to.

BLUE 1 3 5 ..... RED 2 4 6 .....

1. Which team does the child who draw a 16 card belong to? ( )
2. Which team does the child who draw a 17 card belong to? ( )
3. Which team does the child who draw a 21 card belong to? ( )
4. What kind of numbers are on the blue team and the red team?

Blue Team ( ) Red Team ( )

5 Circle the numbers on the following number line, which belong to the blue team.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

7 - 2 Whole Numbers

Even and Odd Numbers (2)

Instruction Whole numbers can be either **odd numbers** or **even numbers.**

Even Numbers:
These numbers can be divided by 2 without a remainder.

$0 \longrightarrow 0 \div 2 = 0$
$2 \longrightarrow 2 \div 2 = 1$
$4 \longrightarrow 4 \div 2 = 2$
$6 \longrightarrow 6 \div 2 = 3$
$8 \longrightarrow 8 \div 2 = 4$

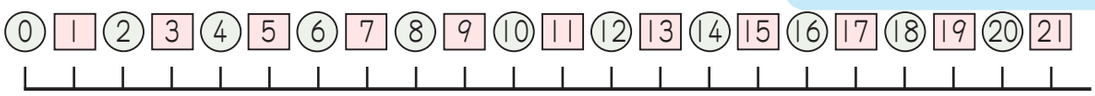
Odd Numbers:
These numbers cannot be divided by 2 without a remainder.
0 is an even number.

$1 \longrightarrow 1 \div 2 = 0$ R1
$3 \longrightarrow 3 \div 2 = 1$ R1
$5 \longrightarrow 5 \div 2 = 2$ R1
$7 \longrightarrow 7 \div 2 = 3$ R1
$9 \longrightarrow 9 \div 2 = 4$ R1

Even and odd numbers have an alternating pattern on the number line.

Even Numbers: ○ **Odd Numbers:** □

"0" is an even number because it is divisible by 2.

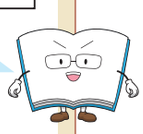


Example Categorize the following numbers as even or odd numbers.

27 42 87 342

Even Numbers: 42, 342

Odd Numbers: 27, 87



What digit should we look at to decide whether or not a number can be divided by 2 without a remainder? We can look at the digit in the ones place!!

1 Categorize the following numbers as even or odd numbers.

12 35 60 107 523 1268

Even Numbers: ____ Odd Numbers: ____

2 Are the following even numbers or odd numbers?

① 9876 ② 12345 ③ 736452 ④ 2938470 ⑤ 10000001

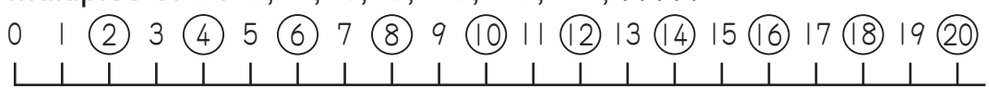
①	②	③	④	⑤

7 - 3 Whole Numbers

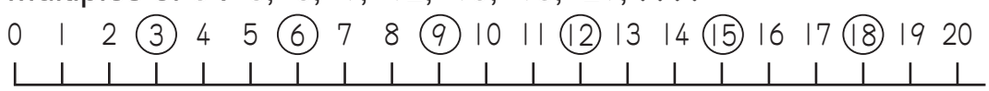
Multiples and Common Multiples (1)

Instruction A multiple is a general term for a number multiplied by a whole number.

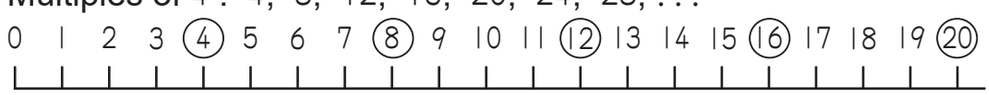
Multiples of 2 : 2, 4, 6, 8, 10, 12, 14, ...



Multiples of 3 : 3, 6, 9, 12, 15, 18, 21, ...



Multiples of 4 : 4, 8, 12, 16, 20, 24, 28, . . .

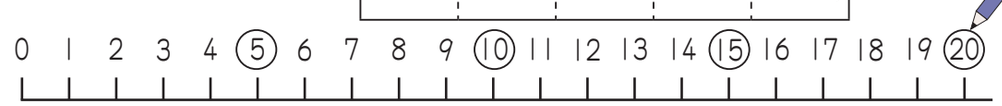


The number 0 is not considered a multiple.

We can find the multiples of 2 by doing $2 \times 1 = 2$, $2 \times 2 = 4$, $2 \times 3 = 6$, $2 \times 4 = 8$, $2 \times 5 = 10$, $2 \times 6 = 12$, $2 \times 7 = 14$, $2 \times 8 = 16$, $2 \times 9 = 18$, ...

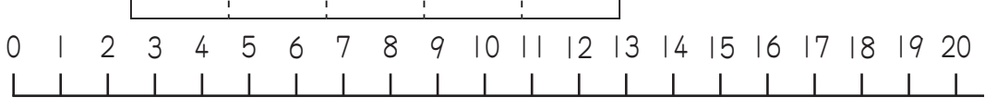
Example Write five multiples of 5 starting from the smallest number and Circle these numbers showed on the number line.

From the smallest | 5 | 10 | 15 | 20 | 25 |

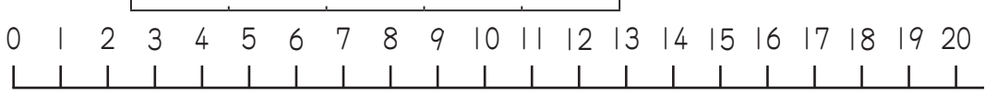


Write five following multiples starting from the smallest number and circle these numbers showed on the number line < only for 1 and 2 >.

1 Multiples of 6



2 Multiples of 7



3 Multiples of 8

4 Multiples of 9

5 Multiples of 10

7 – 4 Whole Numbers

Multiples and Common Multiples (2)

Instruction Multiples of 2 and multiples of 3 can be shown as follows;

Multiples of 2 : 2, 4, 6, 8, 10, 12, 14, 16, 18, ...

Multiples of 3 : 3, 6, 9, 12, 15, 18, 21, . . .

6, 12 and 18 are numbers found in both groups. These numbers are called **common multiples** of 2 and 3.
6 is the smallest common multiple number of 2 and 3. This is called the **least common multiple**.

Example Write the first ten multiples of 4 and the first 10 multiples of 5. Find three common multiples of 4 and 5. Find the least common multiples of 4 and 5.

Multiples of 4	4	8	12	16	20	24	28	32	36	40
Multiples of 5	5	10	15	20	25	30	35	40	45	50

Common multiples of 4 and 5: 20, 40, 60

Least common multiple of 4 and 5: 20

Continue finding the multiples of 4 and 5. We can find 3 common multiples.

1 Write the first ten multiples of 2 and the first ten multiples of 4. Find three common multiples of 2 and 4. Find the least common multiple of 2 and 4.

Multiples of 2										
Multiples of 4										

Common multiples of 2 and 4: ( ) ( ) ( )

Least common multiple of 2 and 4: ( )

2 Write the first ten multiples of 6 and the first ten multiples of 8. Find three common multiples of 6 and 8. Find the least common multiple of 6 and 8.

Multiples of 6										
Multiples of 8										

Common multiples of 6 and 8: ( ) ( ) ( )

Least common multiple of 6 and 8: ( )

Continue finding the multiples of 6 and 8. We can find 3 common multiples.

7 - 5 Whole Numbers

Factors and Common Factors (1)

Instruction A factor is a number that can divide the number in question evenly with no remainders.

Factors of 8 : 1, 2, 4, 8

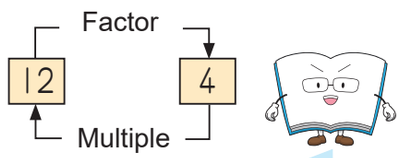
Factors of 12 : 1, 2, 3, 4, 6, 12

Factors of 15 : 1, 3, 5, 15

Factors of 7 : 1, 7

Factors of 13 : 1, 13

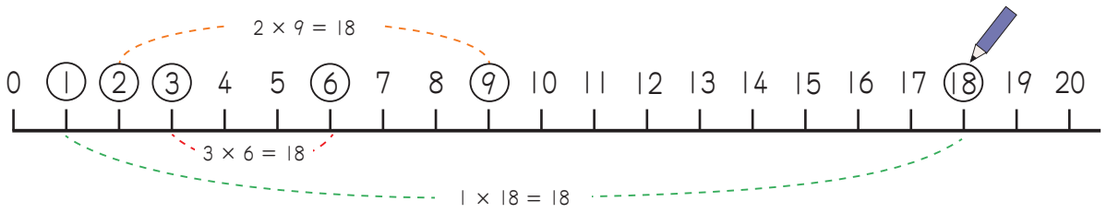
} **Prime Numbers**



Factors and multiples are related to each other. 4 is a factor of 12. 12 is a multiple of 4.

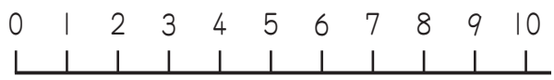
Prime numbers have only tow factors: 1 and the number itself.

Example Circle the factors of 18 on the number line.

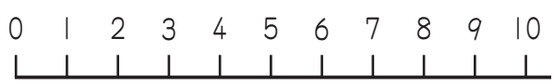


Circle the following numbers on the number line.

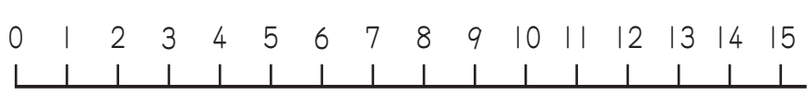
1 Factors of 6



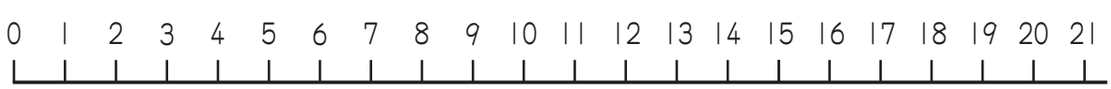
2 Factors of 10



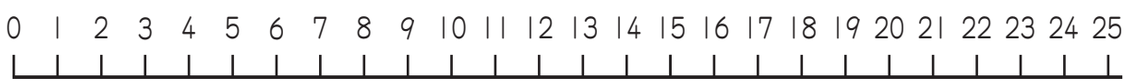
3 Factors of 14



4 Factors of 20



5 Factors of 24



7 – 6 Whole Numbers

Factors and Common Factors (2)

Instruction Factors of 8 and factors of 12 are as follows;

Factors of 8 : 1, 2, 4, 8

Factors of 12 : 1, 2, 3, 4, 6, 12

Factors such as 1, 2 and 4 that are factors of both 8 and 12 are called **common factors of 8 and 12**.
The largest common factor is called the **greatest common factor**.

Example Write the factors of 15 and the factors of 18. Then, write the common factors and the greatest common factor.

Factors of 15: 1, 3, 5, 15

Factors of 18: 1, 2, 3, 6, 9, 18

Common factors of 15 and 18: 1, 3

Greatest common factor of 15 and 18: 3

1 Write the factors of 12 and the factors of 16. Then write the common factors and the greatest common factor.

Factors of 12:

Factors of 16:

Common factors of 12 and 16:

Greatest common factor of 12 and 16:

2 Write the factors of 18, the factors of 27, and the factors of 36. Then write the common factors and the greatest common factor.

Factors of 18:

Factors of 27:

Factors of 36:

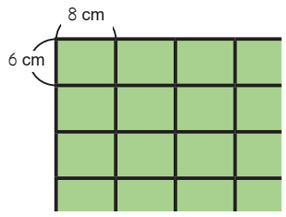
Common factors of 18, 27 and 36:

Greatest common factor of 18, 27 and 36:

7 - 7 Whole Numbers
Application of Common Multiples and Factors

Example A square was made by placing 6 cm wide and 8 cm long papers edge to edge. What is the length of one side of the smallest square that can be made?

A square has the same length on all four sides.
We think about the common multiples of 6 and 8, especially the least common multiples. This should be the length of the sides of the smallest square.



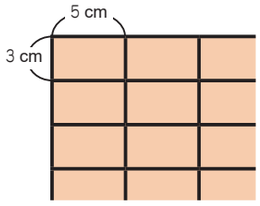
Multiples of 6: 6, 12, 18, 24, 30, 36, ...

Multiples of 8: 8, 16, 24, 32, 40, 48, ...

Least common multiples of 6 and 8: 24

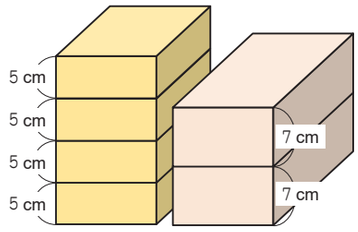
Answer: 24 cm

1 Rectangular tiles 3 cm wide and 5 cm long are placed edge to edge to make a square. What is the length of one side of the smallest square that can be made? How many tiles are needed to make the square?



Answer _____

2 A box with a height of 5 cm and another box with a height of 7 cm are stacked separately. How many cm are the heights of both boxes the same? How many boxes with 5 cm and 7 cm are there at that time?



Answer _____

7 - 8 Whole Numbers

Review

1 Categorize the following numbers as even or odd numbers.

8　　15　　63　　100　　398　　2839

Even Numbers ☐　　Odd Numbers ☐

2 Write the least common multiple of the numbers in each (　).

1 (2, 7) ☐　　2 (4, 10) ☐

3 (3, 5, 6) ☐

We can find it by listing up each multiples of 3, 5, and 6.

Multiples of 3 ☐☐☐☐☐☐☐☐☐☐

Multiples of 5 ☐☐☐☐☐☐☐☐☐☐

Multiples of 6 ☐☐☐☐☐☐☐☐☐☐

4 (4, 8, 10) ☐　　5 (3, 10, 15) ☐

3 Write the greatest common factor of the numbers in each (　).

1 (32, 40) ☐　　2 (27, 81) ☐

3 (4, 12, 18) ☐

We can find it by listing up each factor of 4, 12, and 18.

Factors of 4 ☐

Factors of 12 ☐

Factors of 18 ☐

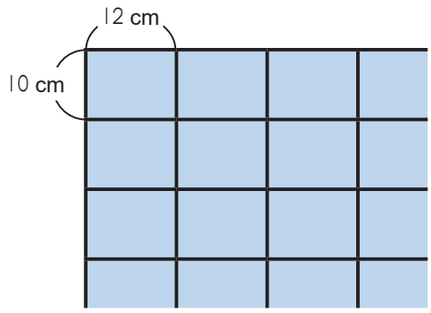
4 (8, 16, 20)

5 (12, 36, 60)

4 Which numbers are the prime numbers among the following?

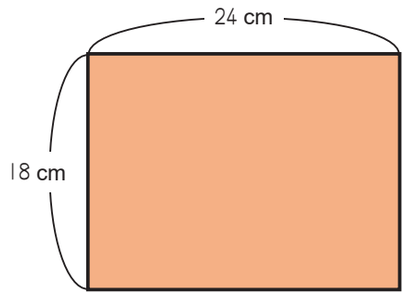
61 71 81 91 101 111

5 The smallest possible square is made by placing 10 cm wide and 12 cm long rectangular tiles edge to edge. What is the length of one side of the square? How many tiles are needed to make the square?



Answer

6 We want to cut out squares that are the same size from a piece of paper that is 18 cm wide and 24 cm long with no paper scraps remaining. What size are the squares? How many squares will we have?



Answer