Divisibility

A number ***a*** is ***divisible*** by another number ***b*** if the division ***a*** ÷ ***b*** is exact (no remainder).

For example, 18 ÷ 3 = 6. So, 18 is divisible by 3. Also, 18 is divisible by 6, because we can write the other division 18 ÷ 6 = 3. So, 18 is divisible by both 6 and 3.

We say 6 and 3 are ***divisors*** or ***factors*** of 18.

You can use long division to check if a number is divisible by another.

67 ÷ 4 = 16, R3. There is a remainder, so 67 is *not* divisible by 4.

Also, from this we learn that neither 4 nor 16 is a factor (divisor) of 67.

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  16
4 | 67
  -4
   27
  -24
    3
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1. Divide and determine if the numbers are divisible by the given number.

a. 21 ÷ 3 = _____ Is 21 divisible by 3?	**b.** 40 ÷ 6 = _____ Is 40 divisible by 6?	**c.** 84 ÷ 7 = _____ Is 7 a factor of 84?

2. Answer the questions. You may need long division.

a. Is 98 divisible by 4?	**b.** Is 603 divisible by 7?	**c.** Is 3 a factor of 1256?

In any multiplication, the numbers that are multiplied are called ***factors*** and the result is called a ***product***.

factor		factor		product
7	×	6	=	42

So, since 6 × 7 = 42, 6 and 7 are ***factors*** of 42.

From this multiplication fact we can write two divisions: 42 ÷ 6 = 7 and 42 ÷ 7 = 6. So, this also means that 42 is divisible by both 6 and 7.

Yet one more new word that ties in with all of this: ***multiple***.

We say ***42 is a multiple of 6***, because 42 is some number times 6, namely 7 × 6.

And of course 42 is also a multiple of 7, because it is some number times 7!

3. Fill in.

Here's a multiplication fact: 8 × 9 = 72. So, 8 is a _____ of 72, and so is 9. Also, 72 is a _____ of 8, and also 72 is a _____ of 9. And, 72 is _____ by 8 and also by 9.

4. Fill in.

a. Is 5 a factor of 55? Yes, because ____ × ____ = _____.	**b.** Is 8 a divisor of 45? No, because ____ ÷ ____ = _____.
c. Is 36 a multiple of 6? ____, because ____ × ____ = _____.	**d.** Is 34 a multiple of 7? _____, because ____ ÷ ____ = _____.
e. Is 7 a factor of 46? ____, because _____.	**f.** Is 63 a multiple of 9? ____, because _____.

Multiples of 6 are all those numbers we get when we multiply 6 by other numbers.
For example, we can multiply 0 × 6, 7 × 6, 11 × 6, 109 × 6, and so on, and the resulting numbers are all multiples of six.

In fact, the skip-counting pattern of 6 gives us a list of multiples of 6:

0, 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, and so on.

5. **a.** Make a list of multiples of 11, starting at 0 and at least till 154.

b. Make a list of multiples of 111, starting at 0. Make it as long as you can in this space!

Divisibility by 2

Numbers that are divisible by 2 are called ***even*** numbers.
Numbers that are NOT divisible by 2 are called ***odd*** numbers.

Even numbers end in 0, 2, 4, 6, or 8. Every second number is even.

Divisibility by 5

Numbers that end in 0 and 5 are divisible by 5.

For example, 10, 35, 720, and 3675 are such numbers.

6. Mark with "x" if the numbers are divisible by 2 or 5.

number	divisible		number	divisible		number	divisible	
	by 2	by 5		by 2	by 5		by 2	by 5
750			755			760		
751			756			761		
752			757			762		
753			758			763		
754			759			764		

Divisibility by 10

Numbers that end in 0 are divisible by 10.

For example, 10, 60, 340, and 2570 are such numbers.

7. Mark an "x" if the numbers are divisible by 2 or 5 or 10.

number	divisible			number	divisible			number	divisible		
	by 2	by 5	by 10		by 2	by 5	by 10		by 2	by 5	by 10
860				865				870			
861				866				871			
862				867				872			
863				868				873			
864				869				874			

If a number is divisible by 10, it ends in zero, so it is ALSO divisible by ____ and ____.

8. **a.** Write a list of numbers divisible by 2, from 0 to 60.

_____

This is also a list of _____ of 2.

b. In the list above, *underline* those numbers that are divisible by 4.
What do you notice?

c. In the list above, *color* those numbers that are divisible by 6.
What do you notice?

d. Which numbers are divisible by both 4 and 6?

9. **a.** Write a list of numbers divisible by 3, from 0 to 60.

_____

This is also a list of _____ of 3.

b. In the list above, *underline* those numbers that are divisible by 6.
What do you notice?

c. In the list above, *color* those numbers that are divisible by 9.
What do you notice?

10. Use the lists you made in (7) and (8). Find numbers that are divisible by *both* 2 and 9.

11. What number is a factor of every number?

12. Twenty is a multiple of 4. It is also a multiple of 5. It is also a multiple of four other numbers. Which ones?

Who am I? (Hint: I am less than 50.)	*Who am I?* (Hint: I am less than 100.)
Divided by 9, I leave a remainder of 6. Divided by 4, I leave a remainder of 1. Divided by 10, I leave a remainder of 3.	I am a multiple of 3, 4, 5, and 6. I am a factor of 120. Divided by 7, I leave a remainder of 4.