

# Multiplication Chart

X	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
13	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195
14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210
15	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225

**To multiply:** find one factor along the left gray edge, find the other factor along the top gray edge. Find the box where that row and column intersect.

**To divide:** find the starting number (dividend) in the white area in the column under the top gray second number (divisor). Find the intersecting number in the left gray column.

# Prime and Composite

Prime numbers have only 2 factors– 1 and itself.

Composite numbers have more than 2 factors.

1 is neither prime nor composite.

91	92	93	94	95	96	97	98	99	100
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

Smallest prime factor is 2  
Smallest prime factor is 3

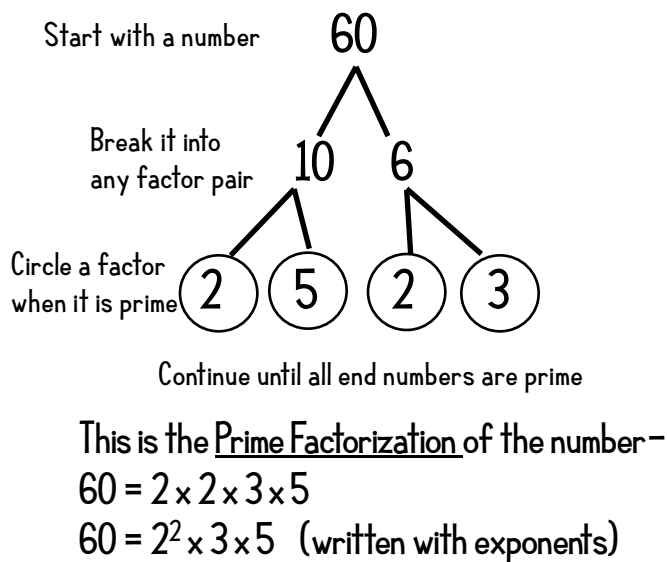
Smallest prime factor is 5  
Smallest prime factor is 7

PRIME

# Factors and Multiples

Factors are the building blocks that make numbers.  
We divide (take a number apart) to find factors.

## Make factor trees to find Prime Factors



## Use Prime Factors to find ALL factors

$$60 = 2 \times 2 \times 3 \times 5$$

$1 \times 60$	$1 \times \underline{2 \times 2 \times 3 \times 5}$
$2 \times 30$	$2 \times \underline{2 \times 3 \times 5}$
$3 \times 20$	$3 \times \underline{2 \times 2 \times 5}$
$4 \times 15$	$\underline{2 \times 2} \times \underline{3 \times 5}$
$5 \times 12$	$5 \times \underline{2 \times 2 \times 3}$
$6 \times 10$	$\underline{2 \times 3} \times \underline{2 \times 5}$

Rearrange the prime factors to make every possible grouping

Multiples are made by multiplying one number times various other numbers.

Making multiples of 4— multiply 4 with another number

	4x1	4x2	4x3	4x4	4x5	4x6	4x7	4x8	4x9	4x10	4x11	4x12
Multiples =	4	8	12	16	20	24	28	32	36	40	44	48

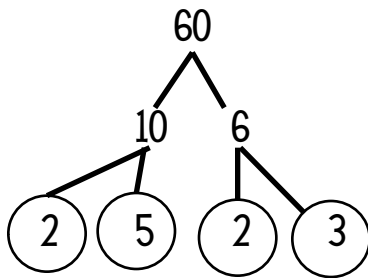
Every number is BOTH a factor and a multiple at the same time!

# GCF and LCM

The Greatest Common Factor is the largest factor that two numbers share. It's the largest number of equal groups they can be broken into.

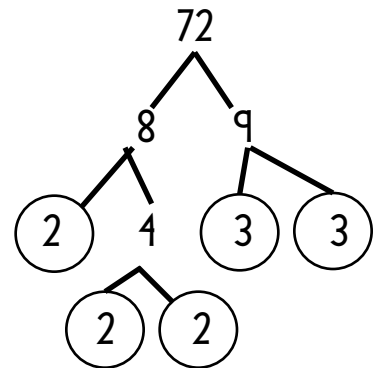
The Least Common Multiple is the smallest multiple that two numbers share. It's the first multiple number where the two numbers will meet.

To find either one, we compare the prime factors of each number.

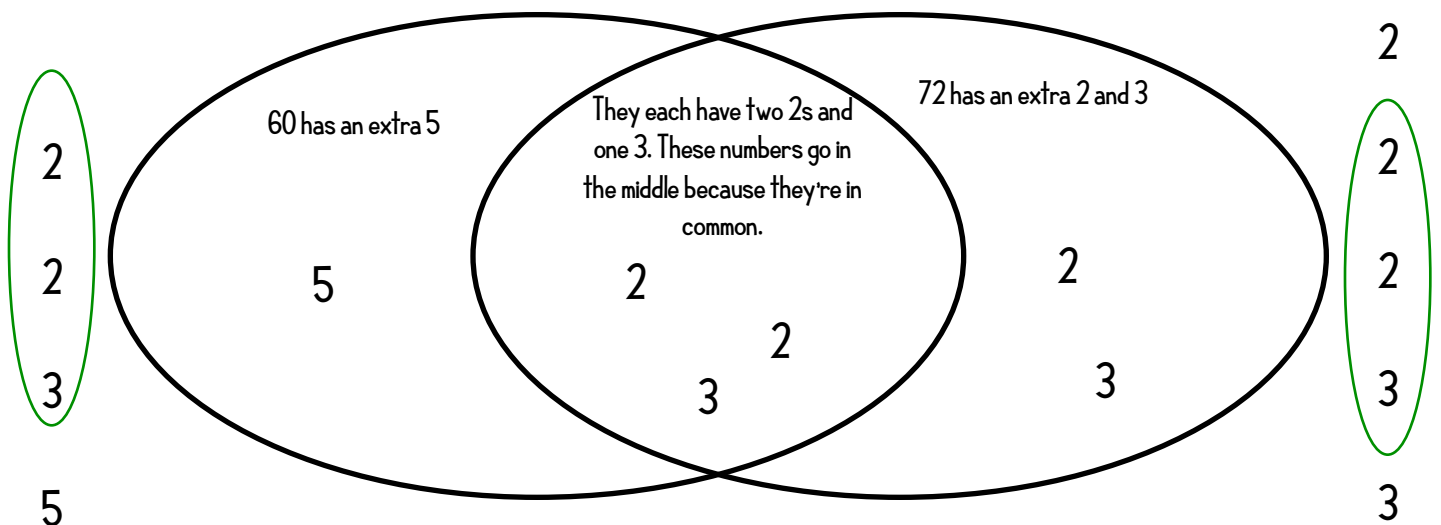


Make factor trees

Sort the factors into a Venn Diagram



To find GCF, we multiply the numbers in the center.  $2 \times 2 \times 3 = 12$



To find LCM, we multiply everything in the Venn Diagram together.  
 $2 \times 2 \times 2 \times 3 \times 3 \times 5 = 360$