Exponents & Powers

Factors are numbers being multiplied.

$6 \cdot 3 = 18$ — factors: 6, 3; Product: 18

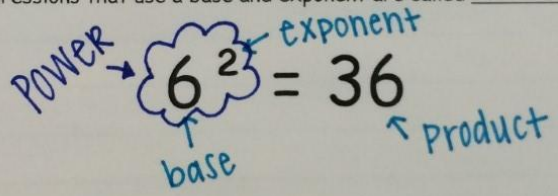
$2 \cdot 3 \cdot 4 = 24$ — factors: 2, 3, 4; Product: 24

When your factors are the same you can simplify it by writing it with an **exponent**. The **base** is the number being multiplied and the **exponent** tells you how many times to multiply the base to itself.

$6 \cdot 6 = 36$ → 6^2

$2 \cdot 2 \cdot 2 \cdot 2 = 16$ → 2^4

Expressions that use a base and exponent are called **Powers**.



Powers	Words
5^2	five squared
4^3	four cubed
3^4	three to the fourth power

* Any number raised to zero is one. Example $2^0 = 1$ $10^0 = 1$

*Any number raised to one is itself. Example $3^1 = 3$ $140^1 = 140$

Exponential Form	Expanded Form	Standard Form
2^4	$2 \cdot 2 \cdot 2 \cdot 2$	16
4^3	$4 \cdot 4 \cdot 4$	64
5^2	$5 \cdot 5$	25

Try these on your own, in **PENCIL**!

Exponential Form	Expanded Form	Standard Form
7^2	$7 \cdot 7$	49
4^4	$4 \cdot 4 \cdot 4 \cdot 4$	256
8^3	$8 \cdot 8 \cdot 8$	512
5^3	$5 \cdot 5 \cdot 5$	125
10^5	$10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$	100,000
10^3	$10 \cdot 10 \cdot 10$	1,000
2^5	$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	32
6^4	$6 \cdot 6 \cdot 6 \cdot 6$	1296
5^1	5	5
3^5	$3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$	243

Is 2^3 to same as 3^2? Justify your answer.

NO

2^3 means $2 \cdot 2 \cdot 2$ which $= 8$

3^2 means $3 \cdot 3$ which $= 9$

The formula for area of a square is $A = s^2$ where s is the side length. Find the area of these squares:

6 in.

$A = s^2$

$A = 6^2$

$A = 36\ in^2$

3cm

$A = s^2$

$A = 3^2$

$A = 9\ cm^2$