Definitions

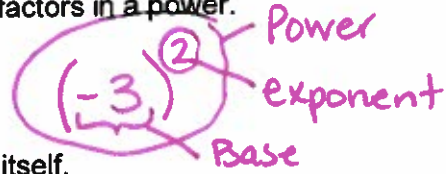**Power:** a numerical expression that shows repeated multiplication.
Base: the number used as a factor in a power
**Exponent:** the number used to express the number of factors in a power.

Power → ⑤^{③} — Exponent   Power
Exponent
Base $(-3)^{②}$ — exponent
Base

Perfect Square: the product of a number multiplied by itself.

ex $\underline{1} = 1 \times 1$ $\underline{4} = 2 \times 2$ $9 = 3 \times 3$ $16 = 4 \times 4$ $\underline{25} = 5 \times 5$ $\underline{36} = 6 \times 6$

Perfect Cube: the product of a number multiplied by itself twice.

$1 = 1 \times 1 \times 1$ $8 = 2 \times 2 \times 2$ $27 = 3 \times 3 \times 3$ $64 = 4 \times 4 \times 4$
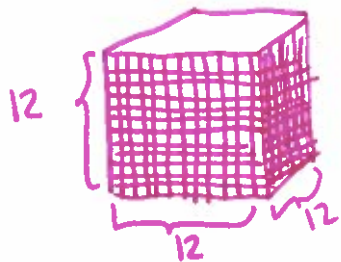
Ex 1) A square wall tile has an area of 100 cm^2. Represent the area of the tile as a geometric model and as a power.   10 cm
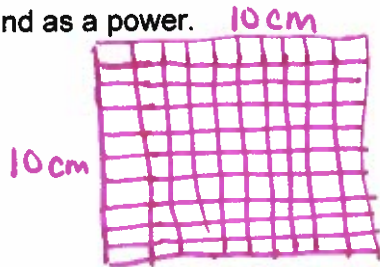
10 cm

$10 \, cm \times 10 \, cm = 100 \, cm^2$

$10^2 = 100$.

Ex 2) A softball comes in a cube-shaped box with a volume of 1728 cm^3. Represent the volume of this box as a geometric model and as a power.

12

12   12

$Volume = side \times side \times side$
$1728 cm^3 = s^3$
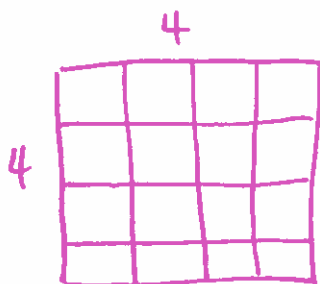$\sqrt[3]{1728 cm^3} = \sqrt[3]{s^3}$
$12 \, cm = s$

Ex 3) Write $2 \times 2 \times 2 \times 2 \times 2$ in exponential form and then evaluate the power.

$2^5 = 32$
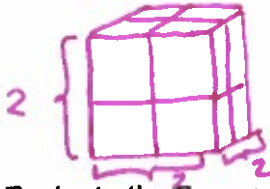
Ex 4) Use a model to evaluate 4^2

4

4

Area of a square = side × side.

16 units squared.

Ex 5) Use a model to evaluate the power of 2^3.

$$2^3 = 2 \times 2 \times 2$$
$$= 2(2 \times 2)$$

Volume of cube $= l \times w \times h$
$$= 2 \times 2 \times 2$$
$$= 8 \text{ units squared}$$

Ex 6) Evaluate the power $\left(\frac{2}{5}\right)^4$.

$$\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\left(\frac{2}{5}\right)\left(\frac{2}{5}\right) = \frac{2 \times 2 \times 2 \times 2}{5 \times 5 \times 5 \times 5} = \frac{16}{625}$$

Ex 7) Evaluate each power.

a) $(-2)^4$ $= (-2)(-2)(-2)(-2) = 16$

b) -2^4 $= -\ 2 \times 2 \times 2 \times 2 = -16$

c) $(-4)^3$ $= (-4)(-4)(-4) = -64$

d) $(-0.9)^2 = (-0.9)(-0.9) = 0.81$