

Lesson Plan

What is pi?

- Pi, or π , is a number that is used to represent the ratio between a circle's circumference and its diameter.
- The value of pi is always the same no matter how big the circle is.
- Its actual value is slightly bigger than 3, but we tend to just use 3 to make calculations easier.

Pi is used in every formula where we are trying to work out the size or shape of a **circular** object.

For example:

- circumference of circle = πd
- area of a circle = πr^2
- surface area of sphere = $4\pi r^2$
- volume of sphere = $\frac{4}{3}\pi r^3$
- Square and cube numbers are special sequences of numbers that are linked to the property of the shape they are named after.
- A **square** number relates to the **area** of a square.
- A **cube** number relates to the **volume** of a cube.

Square numbers

The area of a square is calculated by length $\times$ length.

The area of a 1 unit by 1 unit square is $1 \times 1 = 1$

The area of a 4 unit by 4 unit square is $4 \times 4 = 16$

The first six square numbers are: $1 \times 1 = 1$

$$2 \times 2 = 4$$

$$3 \times 3 = 9$$

$$4 \times 4 = 16$$

$$5 \times 5 = 25$$

$$6 \times 6 = 36$$

Cube numbers

The volume of a cube is calculated by $\text{length} \times \text{length} \times \text{length}$.

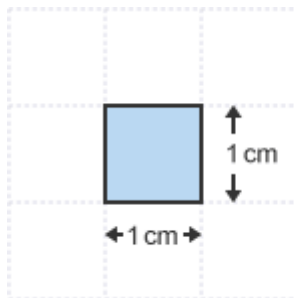
The volume of a 1 unit by 1 unit by 1 unit cube is $1 \times 1 \times 1 = 1$

The volume of a 4 unit by 4 unit by 4 unit cube is $4 \times 4 \times 4 = 64$

The first six cube numbers are:

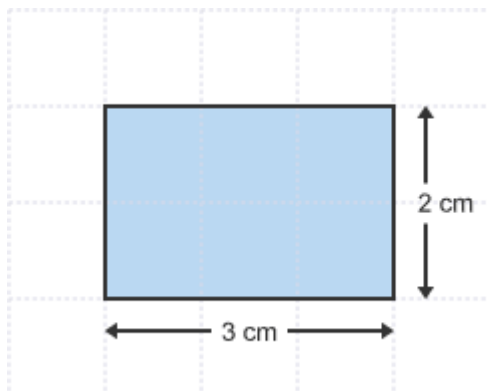
- $1 \times 1 \times 1 = 1$
- $2 \times 2 \times 2 = 8$
- $3 \times 3 \times 3 = 27$
- $4 \times 4 \times 4 = 64$
- $5 \times 5 \times 5 = 125$
- $6 \times 6 \times 6 = 216$

Counting squares



A square centimetre is the area within a square with sides of length **1 cm**, as shown above.

We say that it has an area of **1 cm^2** (**1 cm squared**).

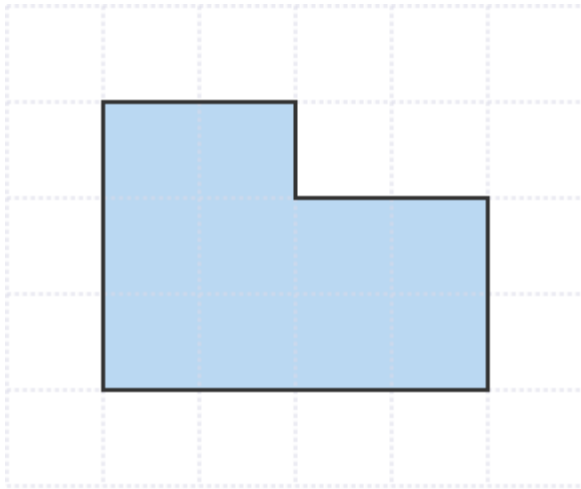


This rectangle contains six squares. Each of the squares has an area of **1 cm^2** , so the area of the rectangle is **6 cm^2** .

Question

By counting the squares, find the area of the following shapes:

a)



b)

