

## Year 5

### 5/1 Place value in numbers to 1million

The position of the digit gives its size

Millions	Hundred thousands	Ten thousands	thousands	hundreds	tens	ones
1	2	3	4	5	6	7

#### Example

The value of the digit '1' is 1 000 000

The value of the digit '2' is 200 000

The value of the digit '3' is 30 000

The value of the digit '4' is 4000

### 5/2 Round numbers to nearest 10, 100, 1000, 10000, 100000

**Example 1-** Round 342 679 to the nearest 10 000

- Step 1 - Find the 'round-off digit' - 4
- Step 2 - Look one digit to the right of 4 - 2

5 or more? NO - leave 'round off digit' unchanged  
- Replace following digits with zeros

**ANSWER - 340 000**

**Example 2-** Round 453 679 to the nearest 100 000

- Step 1 - Find the 'round-off digit' - 4
- Step 2 - **Look** one digit to the right - 5

5 or more? YES - add one to 'round off digit'  
- Replace following digits with zeros

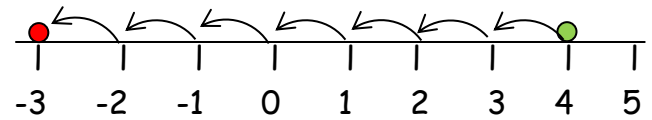
**ANSWER - 500 000**

### 5/3 Negative numbers

A number line is very useful for negative numbers.

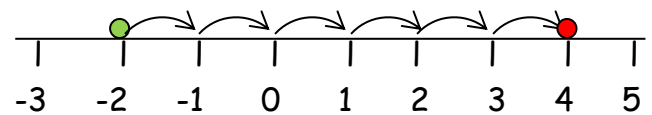
- The number line below shows:

$$4 - 7 = -3$$



- The number line below shows:

$$-2 + 6 = 4$$



### 5/4 Roman Numerals

The seven main symbols



I = 1

V = 5

X = 10

L = 50

C = 100

D = 500

M = 1000

Other useful ones include:

IV = 4

IX = 9

XL = 40

XC = 90

### 5/5 Written methods for addition

- Line up the digits in the correct columns
- Start from RIGHT to LEFT

e.g. 48 + 284 + 9

H	T	U
	4	8
2	8	4
		9
		+
3	4	1
1	2	

### 5/5 Written methods for subtraction

- Line up the digits in the correct columns
- Start from RIGHT to LEFT

e.g. 645 - 427

H	T	U
6	4	5
4	2	7
		-
2	1	8

## 5/6 Mental methods for addition

- Start from **LEFT to RIGHT**

Example 1 - think of:

**45** + **32** as **45** + **30** + 2

- But in your head say:

**45 75 77**

Example 2 - think of:

**1236** + **415** as **1236** + **400** + **10** + 5

- But in your head say:

**1236 1636 1646 1651**

## 5/6 Mental methods for subtraction

Example 1 - think of:

**56** - **32** as **56** - **30** - 2

- But in your head say:

**56 26 24**

Example 2 - think of:

**1236** - **415** as **1236** - **400** - **10** - 5

- But in your head say:

**1236 836 826 821**

## 5/7 Multi-step problems

Based upon 5/6.

**Words associated with addition:**



**Words associated with subtraction:**



## 5/8 Multiples & factors

- **FACTORS** are what divides exactly into a number

e.g. Factors of 12 are:

1	12
2	6
3	4

Factors of 18 are:

1	18
2	9
3	6

The common factors of 12 & 18 are: 1, 2, 3, 6,  
The Highest Common Factor is: 6

- **MULTIPLES** are the times table answers

e.g. Multiples of 5 are:

5	10	15	20	25	.....
---	----	----	----	----	-------

Multiples of 4 are:

4	8	12	16	20	.....
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The Lowest Common Multiple of 5 and 4 is: 20

## 5/9 Prime numbers

**Prime numbers have only TWO factors**

The factors of 12 are:

1, 2, 3, 4, 6, 12



12 is NOT prime  
It is composite

Factors of 7 are:

1, 7

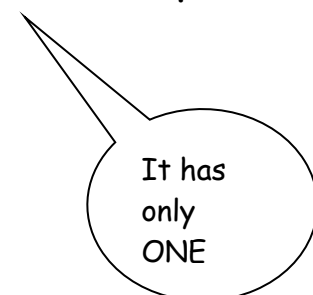


7 IS prime

## Prime numbers to 20

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

The number '1' is NOT prime



## 5/10 Multiplication using a formal method

- By a **ONE-DIGIT** number

e.g.  $3561 \times 7$       COLUMN METHOD

$$\begin{array}{r} 3561 \\ \underline{7 \times} \\ 24927 \\ 34 \end{array}$$

e.g.  $3561 \times 7$       GRID METHOD

	3000	500	60	7
7	21000	3500	420	49

$$21000 + 3500 + 420 + 49 = 24927$$

- By a **TWO-DIGIT** number

e.g.  $152 \times 34$       COLUMN METHOD

$$\begin{array}{r} 152 \\ \underline{34 \times} \\ 608 \quad (\times 4) \\ 4560 \quad (\times 30) \\ \hline \mathbf{5168} \end{array}$$

e.g.  $152 \times 34$       GRID METHOD

	100	50	2
30	<b>3000</b>	<b>1500</b>	<b>60</b>
4	<b>400</b>	<b>200</b>	<b>8</b>

$$152 \times 34 = 3400 + 1700 + 68 = \mathbf{5168}$$

## 5/10 Division using a formal method

- By a **ONE-DIGIT** number

e.g.  $9138 \div 6$        $\begin{array}{r} 1526 \\ 6 \overline{)9138} \end{array}$

- By a **TWO-DIGIT** number

## 5/11 Multiply & divide by 10, 100, 1000

- By moving the decimal point

To multiply by 10 move the dp ONE place RIGHT

e.g.  $13 \overset{\curvearrowright}{} \times 10 = 130$

$$3.4 \overset{\curvearrowright}{} \times 10 = 34$$

To divide by 10 move the dp ONE place LEFT

e.g.  $13 \overset{\curvearrowleft}{} \div 10 = 1.3$

$$\overset{\curvearrowleft}{} 3.4 \div 10 = 0.34$$

- By moving the digits

To multiply by 10 move the digits ONE place LEFT

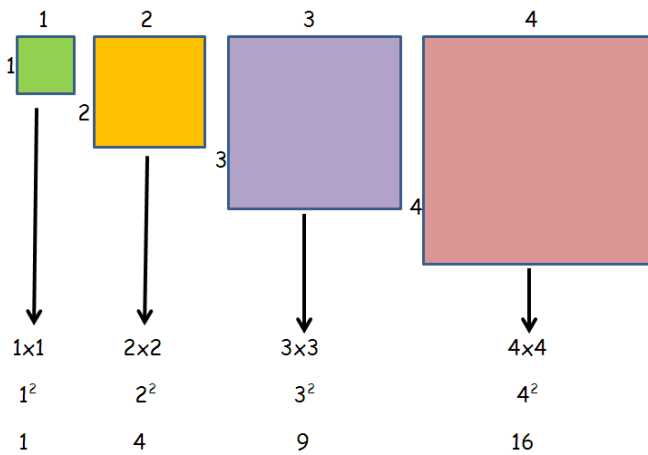
e.g.  $\begin{array}{r} 3.52 \times 10 \\ \swarrow \searrow \\ = 35.2 \end{array}$

To multiply or divide by 100 move TWO places

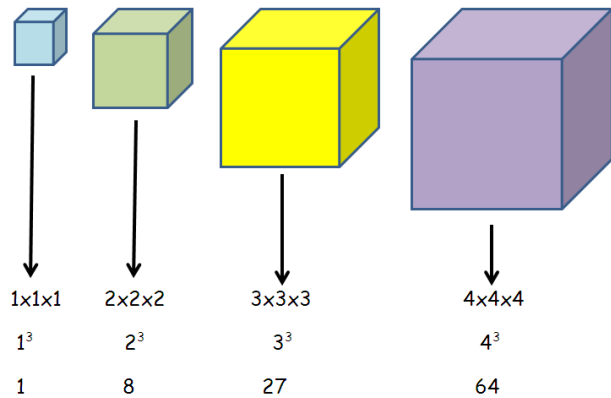
To multiply or divide by 1000 move THREE places

## 5/12 Square & Cube numbers

### Square numbers



### Cube numbers



## 5/13 Fractions

- To compare fractions  
- the denominators must be the same

$$\frac{2}{3} \text{ and } \frac{5}{6} \longrightarrow \text{😬}$$

$$\frac{4}{6} \text{ and } \frac{5}{6} \longrightarrow \text{😄}$$

SO  $\frac{5}{6}$  is bigger than  $\frac{2}{3}$

- To add and subtract fractions

**When the denominators are the same**

$$\frac{5}{8} + \frac{1}{8} = \frac{6}{8}$$

Do not add  
the denominators

$$\frac{5}{8} - \frac{1}{8} = \frac{4}{8}$$

Do not subtract  
the denominators

## 5/13 To add subtract fractions (cont)

**When the denominators are different**

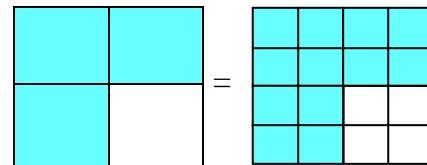
$$\frac{3}{8} + \frac{1}{4} \text{ (x2)}$$

$$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$$

Multiply to make  
the denominators  
the same

## 5/14 Equivalent fractions

These fractions are the same but can be drawn and written in different ways



$$\frac{3}{4} = \frac{12}{16}$$

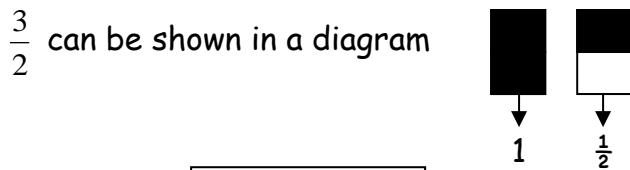
$$\frac{3 \text{ (x4)}}{4 \text{ (x4)}} = \frac{12}{16}$$

Fractions can also be divided to make the fraction look simpler - this is called **CANCELLING** or **LOWEST FORM**

$$\frac{12 \text{ (÷4)}}{16 \text{ (÷4)}} = \frac{3}{4}$$

## 5/15 Mixed & improper fractions

- An improper fraction is top heavy & can be changed into a mixed number



$$\frac{3}{2} = 1\frac{1}{2}$$

Improper fraction

Mixed number

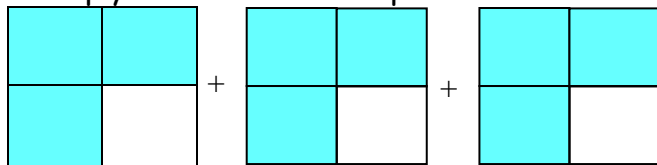
- A mixed number can be changed back into an improper fraction

$$1\frac{1}{2} = \frac{3}{2}$$

$$2\frac{3}{4} = \frac{11}{4}$$

## 5/16 Multiply fractions

Multiply is the same as repeated addition



$$\frac{3}{4} + \frac{3}{4} + \frac{3}{4}$$

$$\frac{3}{4} \times 3 = \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = \frac{9}{4} = 2\frac{1}{4}$$

OR

$$\frac{3}{4} \times \frac{3}{1} = \frac{9}{4} = 2\frac{1}{4}$$

## 5/17 Round decimals

### Rules for rounding

- Find the 'round off' digit
- Move one digit to its right
- Is this digit 5 or more  
Yes - add one to the round off digit  
No - don't change the round off digit

- To the nearest whole number

e.g. 1 - To round **5.62** to the nearest whole

'round off' digit      this digit is 5 or more

5.62 rounded to nearest whole = 6

e.g. 2 - To round **5.32** to the nearest whole

'round off' digit      this digit is NOT 5 or more

5.32 rounded to nearest whole = 5

- To one decimal place

e.g. 1 - To round **12.37** to 1 decimal place

'round off' digit      this digit is 5 or more

12.37 rounded to 1dp = 12.4

e.g. 2 - To round **12.32** to the nearest whole

'round off' digit      this digit is NOT 5 or more

12.37 rounded to 1dp = 12.3

### 5/18 Read & write decimals

The value of each digit is shown in the table

hundreds	tens	ones	•	tenths	hundredths	thousandths
3	5	2	•	6	1	7
300	50	2		$\frac{6}{10}$	$\frac{1}{100}$	$\frac{7}{1000}$
352					$\frac{61}{100}$	$\frac{7}{1000}$
352					$\frac{617}{1000}$	

### 5/19 Decimal & Percentage equivalents

Learn

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{1}{5}$	0.2	20%
$\frac{1}{10}$	0.1	10%
$\frac{1}{100}$	0.01	1%

Some fractions have to be changed to be 'out of 100'

$$\frac{11}{25} \stackrel{(\times 4)}{=} \frac{44}{100} = 0.44 = 44\%$$

### 5/18 Order decimals

Example - To order 0.28, 0.3, 0.216

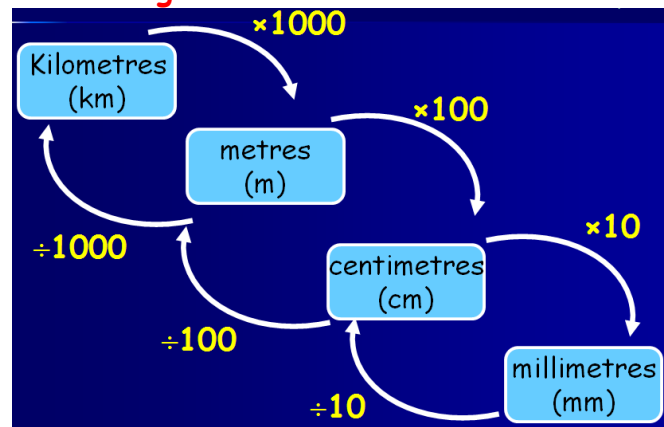
- Write them under each other
- Fill gaps with zeros
- Then order them

0.28 → 0.280  
 0.3 → 0.300  
 0.216 → 0.216

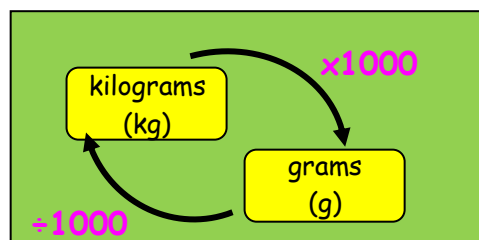
Order: smallest 0.216 0.28 0.3 largest

### 5/20 Convert metric measure

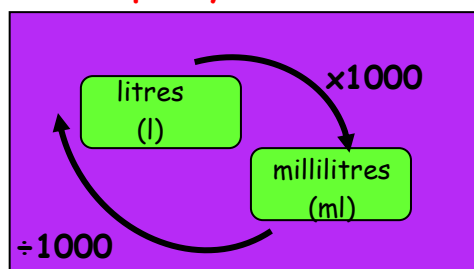
• Length



• Mass or weight

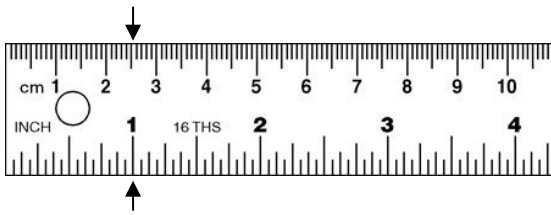


• Capacity or volume



## 5/20 Imperial measure

- 1 inch is about 2.5cm



- 1km = 1.6 miles or 5miles = 8km

- 1kg is about 2.2pounds



- A litres of water's a pint and three quarters

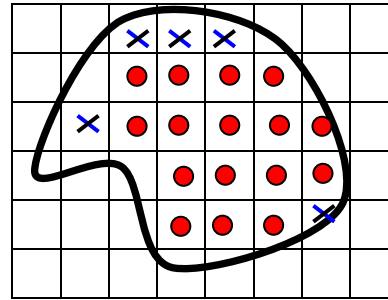


- A gallon is about 4.5 litres



## 5/21 Area & Perimeter

- Estimate area



Number of whole squares (●) = 16

Number of  $\frac{1}{2}$  or more (×) = 5

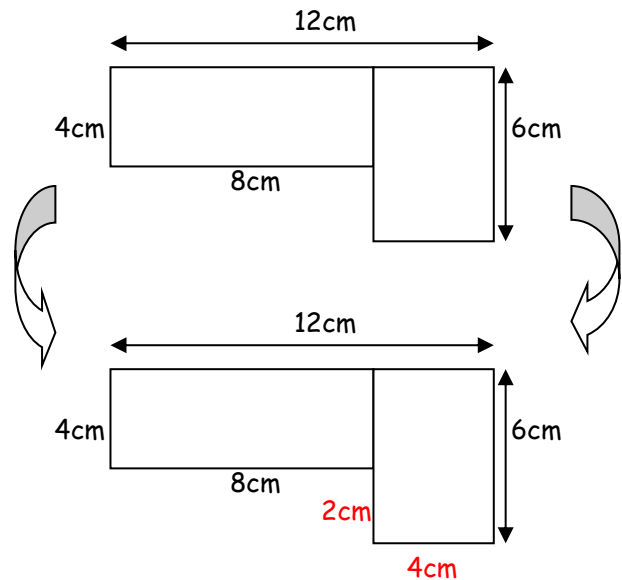
Estimated area = 21 squares

- Shapes composed of rectangles

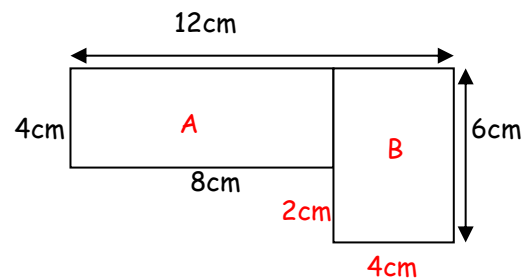
Put on all missing lengths first

For perimeter - ADD all lengths round outside

For area - split into rectangles & add them together



$$\text{Perimeter} = 12 + 6 + 4 + 2 + 8 + 4 = 36\text{cm}$$

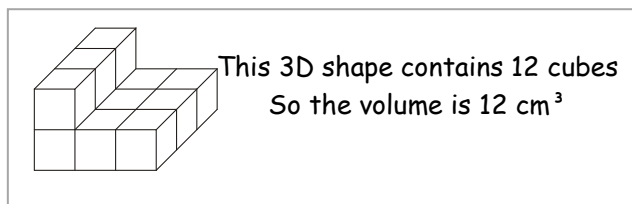
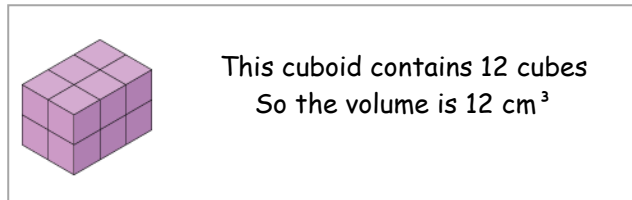
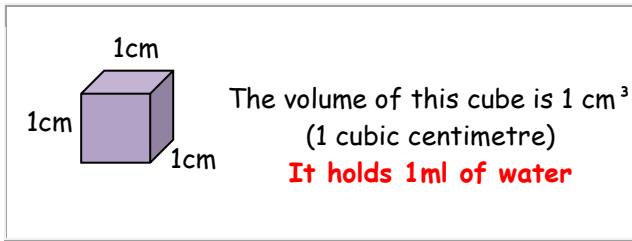


$$\begin{aligned} \text{Area of shape} &= \text{Area of A} + \text{B} \\ &= (8 \times 4) + (6 \times 4) \\ &= 32 + 24 \\ &= \underline{56\text{cm}^2} \end{aligned}$$

## 5/22 Volume

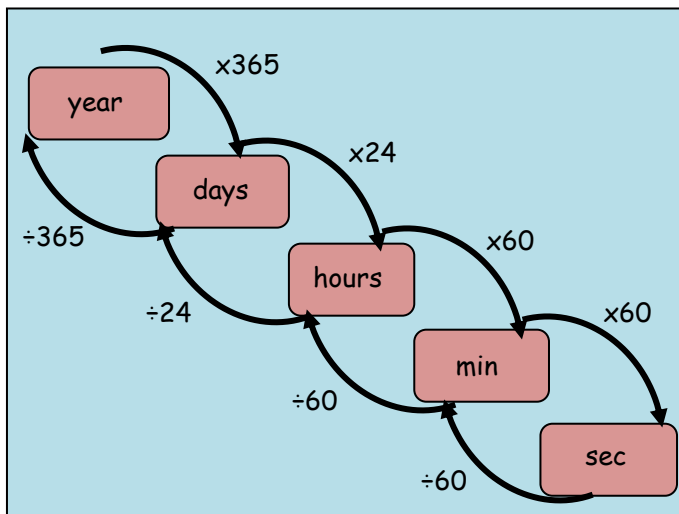
Volume is measured in cubes

### The 1 cm cube



## 5/23 Units of time

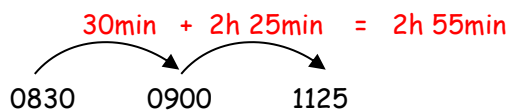
### Time conversion



### Time intervals

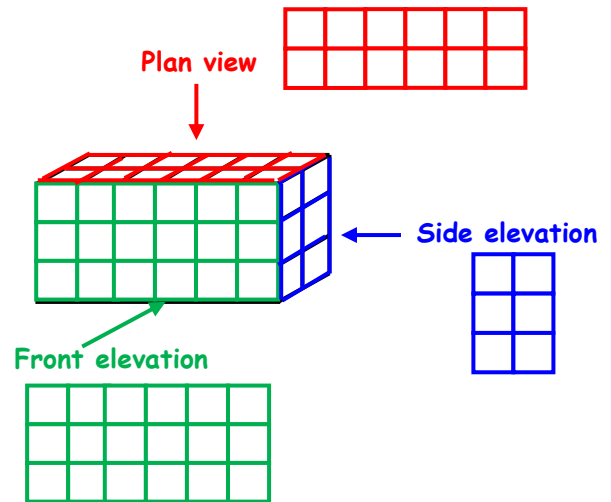
Always go to the next whole hour first

Example: 0830 to 1125



## 5/24 2D representations of 3D shapes

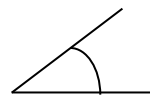
- There are 3 views:



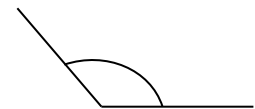
## 5/25 Angles

### Types of angles

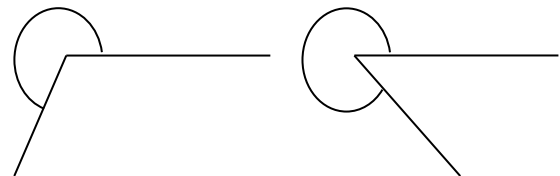
**Acute**  
(less than  $90^\circ$ )



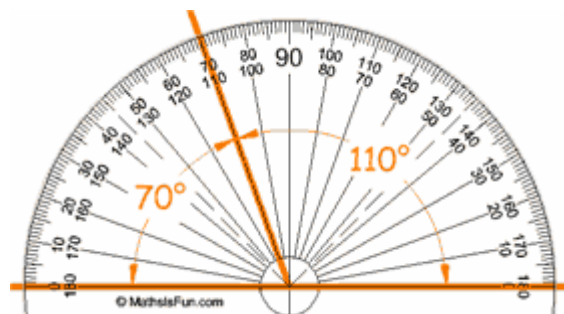
**Obtuse**  
(Between  $90^\circ$  &  $180^\circ$ )



**Reflex**  
(Between  $180^\circ$  &  $360^\circ$ )



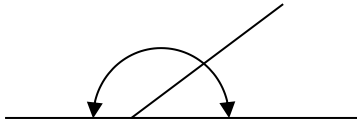
### Measure and draw angles



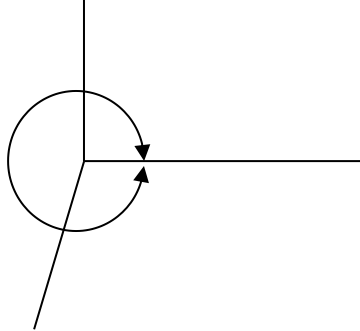
To be sure, count the number of degrees between the two arms of the angle



### 5/26 Angles



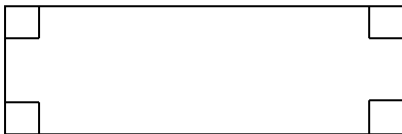
Angles on a straight line add up to  $180^\circ$   
or 2 right angles ( $2 \times 90^\circ$ )



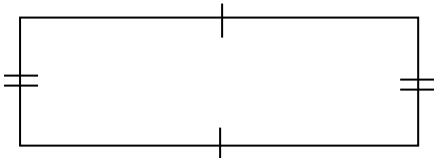
Angles about a point add up to  $360^\circ$   
or 4 right angles ( $4 \times 90^\circ$ )

### 5/27 Properties of the rectangle

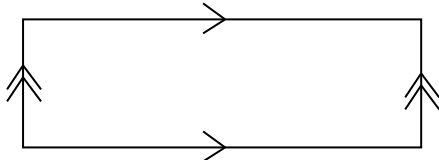
- A rectangle is a quadrilateral (4 sided shape)
- All angles are  $90^\circ$



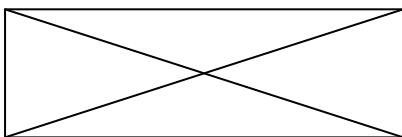
- Opposite sides are equal



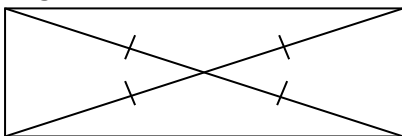
- Opposite sides are parallel



- Diagonals are equal



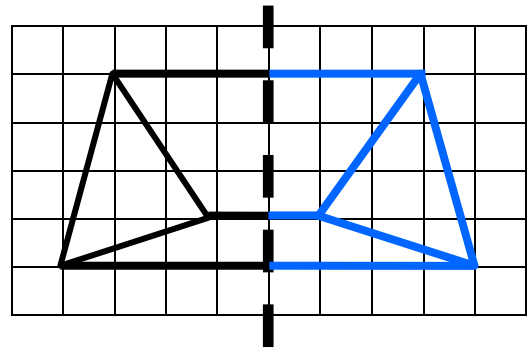
- Diagonals bisect each other (cut in half)



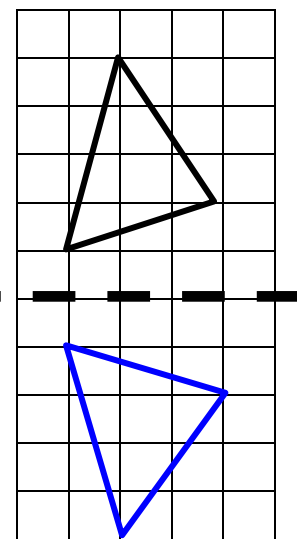
- A square is a special rectangle

### 5/28 Reflection

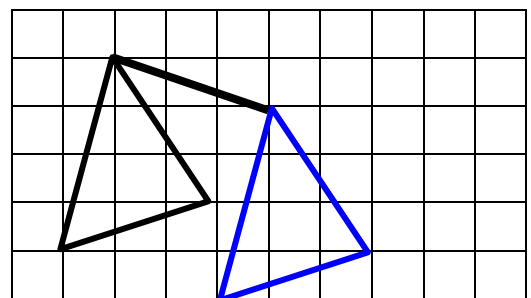
- Reflection in a vertical line



- Reflection in a horizontal line



### 5/28 Translation - 4 right & 1 down



- In reflection and translation the shapes remain the same size and shape - CONGRUENT
- In reflection the shape is flipped over
- In translation the shape stays the same way up

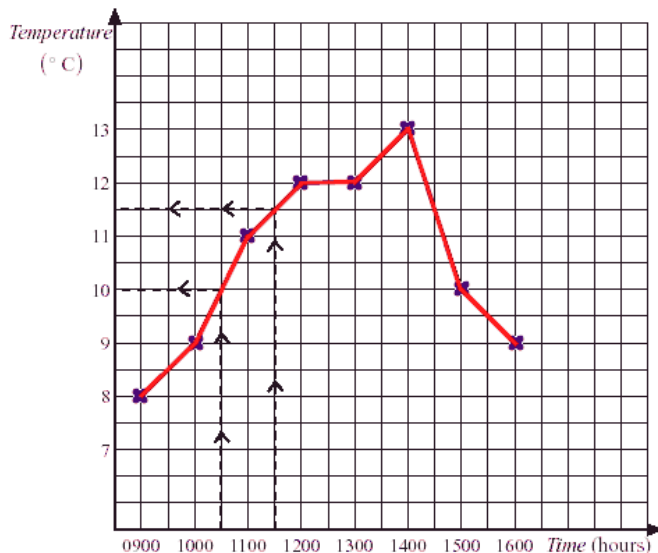
## 5/29 Line graphs

- Find the difference

Hull				
100	Leeds			
162	73	Manchester		
110	60	65	Sheffield	
63	40	118	95	York

**Example 1:** What was the difference in temperature between 1030 and 1130?

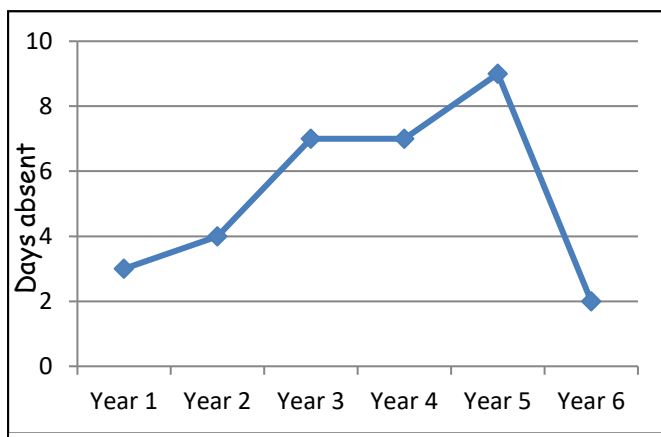
**Answer:**  $11.5^{\circ}\text{C} - 10^{\circ}\text{C} = 1.5^{\circ}\text{C}$



- Find the sum of the data

**Example:** What was the total number of days absent over the 6 years?

**Answer:**  $3 + 4 + 7 + 7 + 9 + 2 = 32$  days



## 5/30 Interpret information in tables

- Distance table

Example: Find the distance between Leeds and York

Answer: 40 miles

- Timetable

Example: How long is the film?

Answer:  $1.10 - 2.35 = 1\text{h } 25\text{min} = 85\text{min}$

6.30am	Educational programme
7.00	Cartoons
7.25	News and weather
8.00	Wildlife programme
9.00	Children's programme
11.30	Music programme
12.30pm	Sports programme
1.00	News and weather
1.10 - 2.35pm	Film

- Table of results of goals scored

Example: Did boys or girls score the most goals?

Answer: Boys:  $6+3+3+6=18$

Girls:  $7+5=12$

Boys scored the most goals

	Game 1	Game 2	Game 3	Game 4	Game 5	Frequency
Peter	1	0	0	2	3	6
John	0	2	1	0	0	3
Ryan	1	0	1	1	0	3
Claire	2	0	2	1	2	7
Bill	3	1	1	0	1	6
Susan	0	1	3	1	0	5