St Mary's CE School Maths Support Resources

Parents often ask us, how can I help my child in maths? Firstly, we provide parents with the expectations for each year to enable them to appreciate the standard required by the end of a school year. The next step is to share with parents, what this really looks like in practice. 'Reach for the Sky' is our initiative to support parents by providing them with information about how to do the calculations required in each class. Each year group is provided with information about what this looks like with visual reminders if you are not sure. These are available on our school website and handed out to all families at the beginning of the year.

We are always happy to discuss this with you; the resources hopefully provide a starting point to supporting your child.

Stage 5 PROMPT sheet

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

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

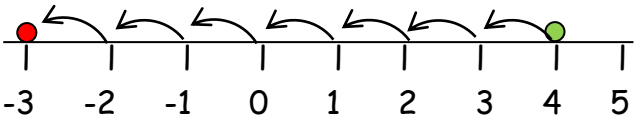
ANSWER – 500 000

3 Negative numbers

A number line is very useful for negative numbers.

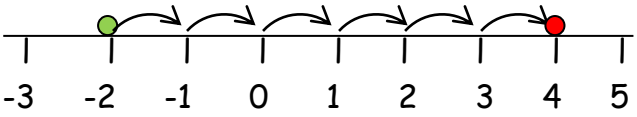
- The number line below shows:

4 - 7 = -3



- The number line below shows:

-2 + 6 = 4



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 Written methods for addition

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

e.g. 48 + 284 + 9

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

5 Written methods for subtraction

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

e.g. 645 - 427

H	T	O	
6	$^{3}\not{4}$	$^{1}5$	
4	2	7	-
2	1	8	

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:

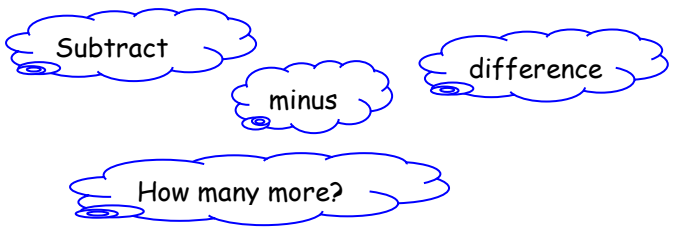
1236 836 826 821

5/7 Multi-step problems

Based upon 5/6.

Words associated with addition:

Words associated with subtraction:



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** .....

The Lowest Common Multiple of 5 and 4 is: **20**

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

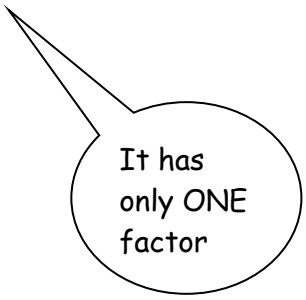
Factors of 7 are:
1, 7

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



10 Multiplication using a formal method

- **By a ONE-DIGIT number**

e.g. 3561 x 7 **COLUMN METHOD**

3561
7x
24927
3 4

e.g. 3561 x 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 x 34 **COLUMN METHOD**

152
34x
608 (x4)
4560 (x30)
5168

e.g. 152 x 34 **GRID METHOD**

	100	50	2
30	**3000**	**1500**	**60**
4	**400**	**200**	**8**

152 x 34 = 3400 + 1700 + 68 = **5168**

10 Division using a formal method

- **By a ONE-DIGIT number**

e.g. 9138 ÷ 6

1 5 2 6
6)9^{3}1^{1}3^{1}8

- **By a TWO-DIGIT number**

e.g. 4928 ÷ 32 **SAME METHOD**

(Except write down some of your tables down first)

32
64
96
128
160

0 1 5 4
32)4^{4}9^{17}2 ^{12}8

4928 ÷ 32 = **154**

e.g. 4928 ÷ 32 **ALTERNATE METHOD**

- Divide
- Multiply
- Subtract
- Bring down - Make a new number
- Divide ...

0 1 5 4
32) 4 9 2 8
-3 2
1 7 2
-1 6 0
1 2 8
-1 2 8
0 0 0

4928 ÷ 32 = **154**

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 X 10 = 130

3.4 x 10 = 34

To **divide** by 10 move the dp ONE place LEFT

e.g. 1 3 ÷ 10 = 1.3

3.4 ÷ 10 = 0.34

- **By moving the digits**

To multiply by 10 move the digits ONE place LEFT

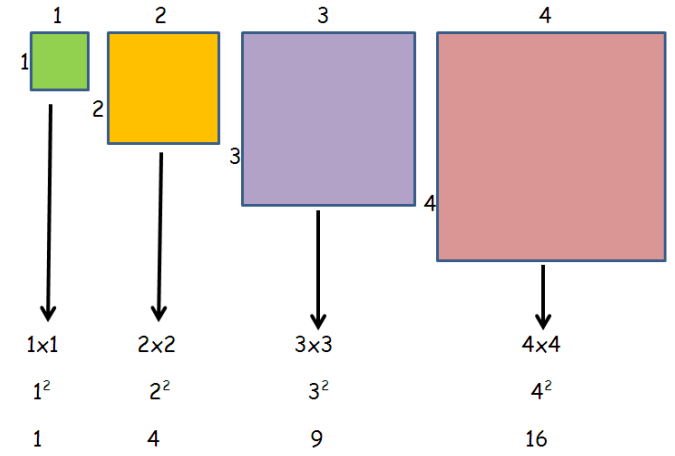
e.g. 3.52 x 10

= 3 5 . 2

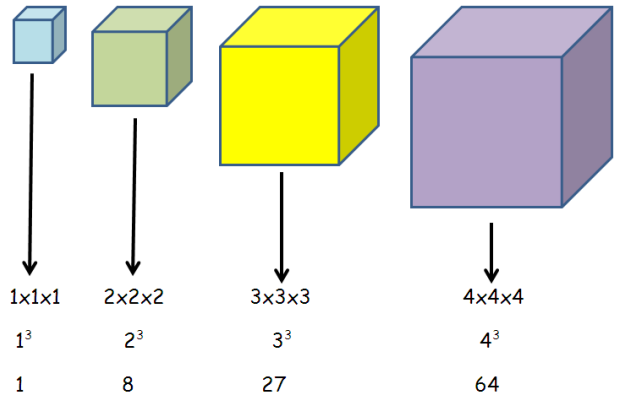
To multiply or divide by 100 move TWO places
To multiply or divide by 1000 move THREE places

12 Square & Cube numbers

Square numbers



Cube numbers



13 Fractions

- To compare fractions
  - the denominators must be the same

$\frac{2}{3}$ and $\frac{5}{6}$ →

$\frac{4}{6}$ and $\frac{5}{6}$ →

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

13 To add subtract fractions (cont)

When the denominators are different

$\frac{3}{8} + \frac{1}{4}^{(\times 2)}$

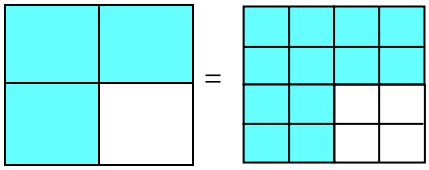
$\downarrow$

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

Multiply to make the denominators the same

14 Equivalent fractions

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



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

$$\frac{3}{4}^{(\times 4)} = \frac{12}{16}$$

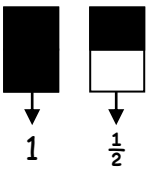
Fractions can also be divided to make the fraction look simpler – this is called CANCELLING or LOWEST FORM

$$\frac{12}{16}^{(\div 4)} = \frac{3}{4}$$

15 Mixed & improper fractions

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

$\frac{3}{2}$ can be shown in a diagram



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

Improper fraction — Mixed number

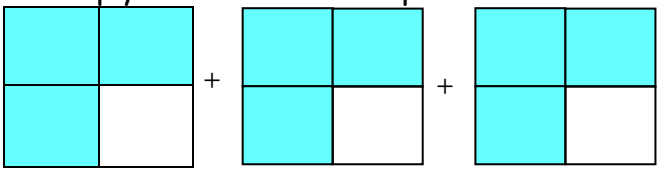
- **A mixed number can be changed back into an improper fraction**

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

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

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

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

17 Round decimals

Rules for rounding

1. **Find the 'round off' digit**
2. **Move one digit to its right**
3. **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 5or more**

12.37 rounded to 1dp = 12.3

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				$\frac{617}{1000}$		

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

smallest largest
Order: 0.216 0.28 0.3

19 Decimal & Percentage equivalents

Learn

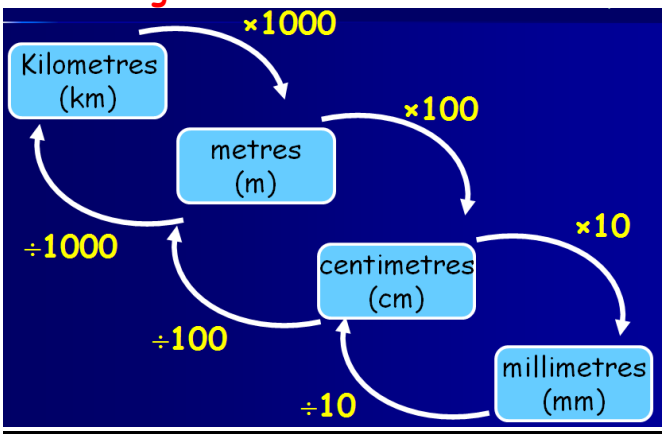
Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{1}{5}$	0.2	20%
$\frac{1}{10}$	0.1	10%
$\frac{1}{100}$	0.01	1%

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

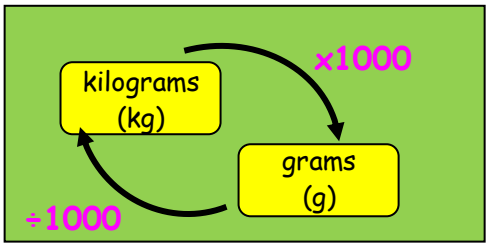
$\frac{11}{25} \overset{(\times 4)}{=} \frac{44}{100} = 0.44 = 44\%$

20 Convert metric measure

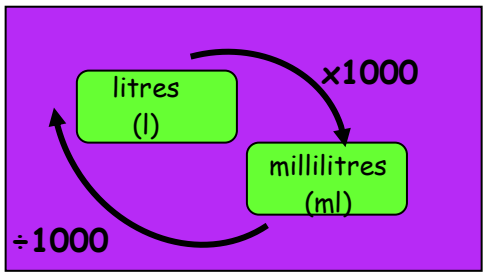
- **Length**



- **Mass or weight**

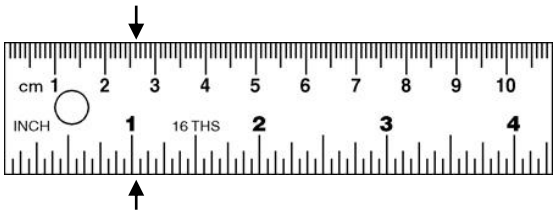


- **Capacity or volume**



20 Imperial measure

- 1 inch is about 2.5cm



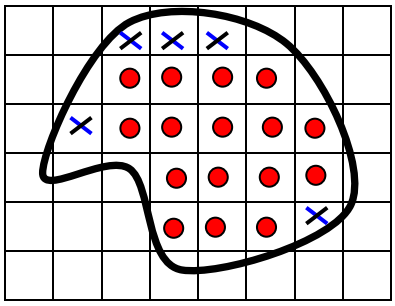
- 1km = 1.6 miles or 5miles = 8km
- 1kg is about 2.2pounds

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

- A gallon is about 4.5 litres

21 Area & Perimeter

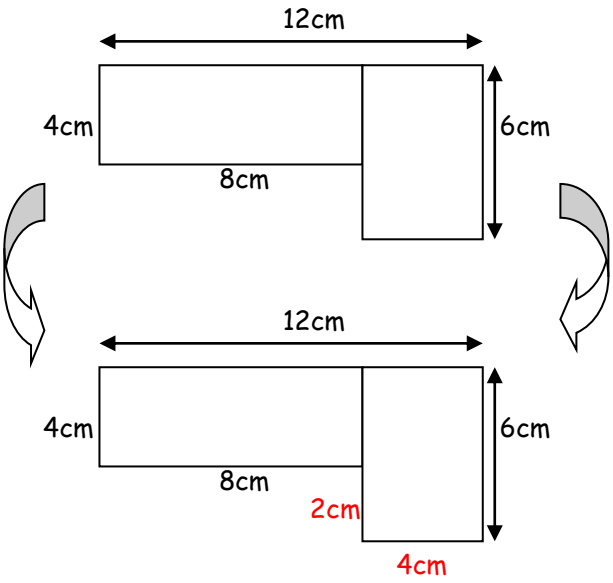
- **Estimate area**



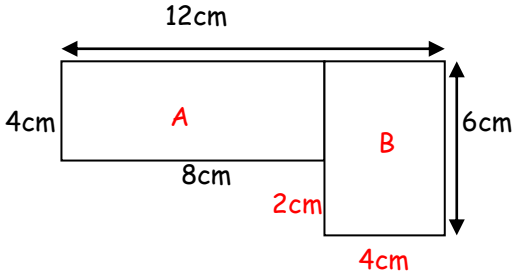
Number of whole squares (●) = 16
Number of ½ or more (×) = 5
Estimated area = 21 squares

- **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



Perimeter = 12 + 6 + 4 + 2 + 8 + 4 = 36cm

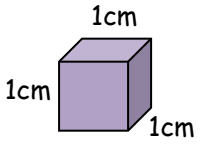


Area of shape = Area of A + B
= (8x4) + (6x4)
= 32 + 24
= 56cm²

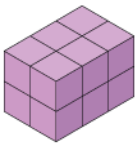
22 Volume

Volume is measured in cubes

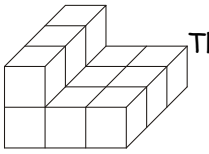
The 1 cm cube



The volume of this cube is 1 cm³
(1 cubic centimetre)
It holds 1ml of water



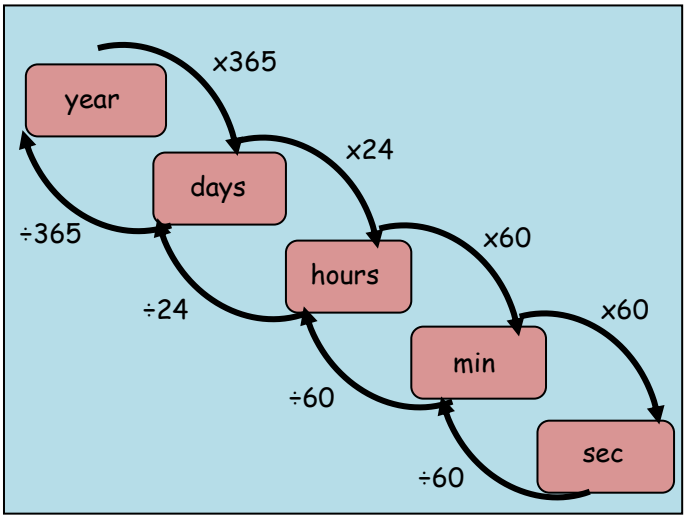
This cuboid contains 12 cubes
So the volume is 12 cm³



This 3D shape contains 12 cubes
So the volume is 12 cm³

23 Units of time

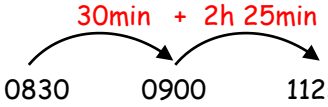
- **Time conversion**



- **Time intervals**

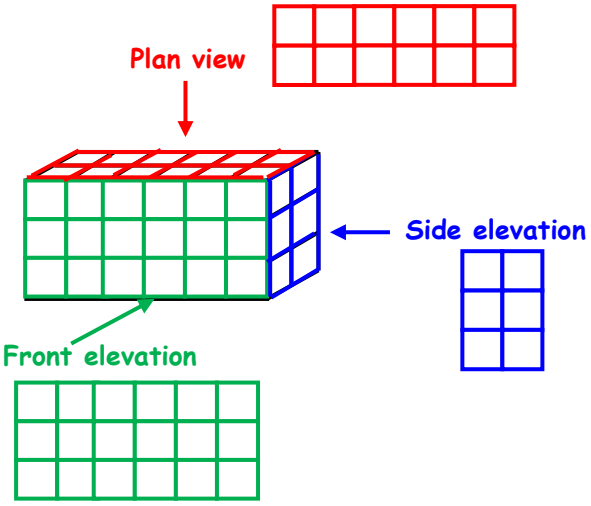
Always go to the next whole hour first

Example: 0830 to 1125



24 2D representations of 3D shapes

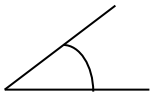
- There are 3 views:



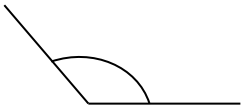
25 Angles

- **Types of angles**

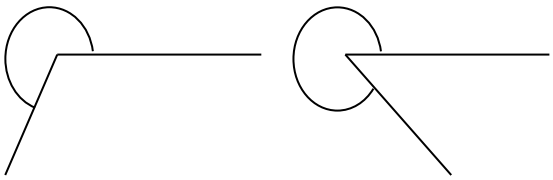
Acute
(less than 90^0)



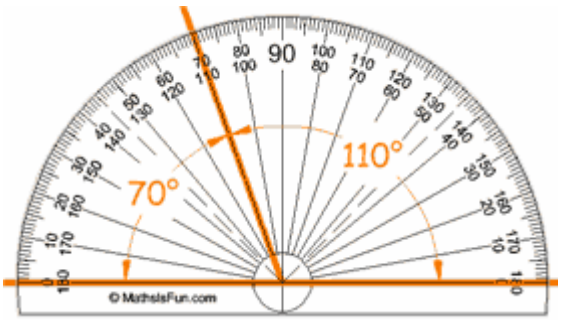
Obtuse
(Between 90^0 & 180^0)



Reflex
(Between 180^0 & 360^0)

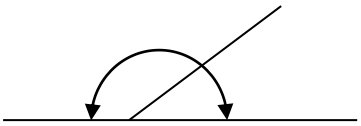


- **Measure and draw angles**

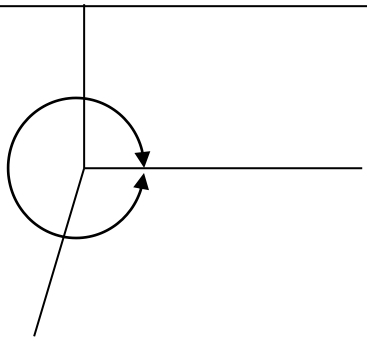


To be sure, count the number of degrees between the two arms of the angle

26 Angles



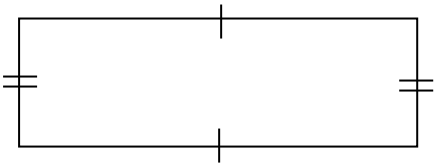
Angles on a straight line add up to 180^0 or 2 right angles (2×90^0)



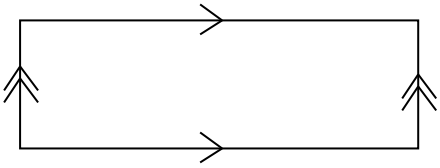
Angles about a point add up to 360^0 or 4 right angles (4×90^0)

27

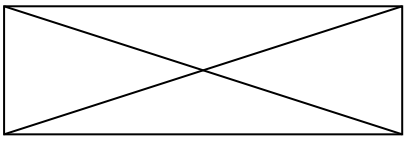
- Opposite sides are equal



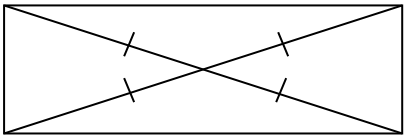
- Opposite sides are parallel



- Diagonals are equal



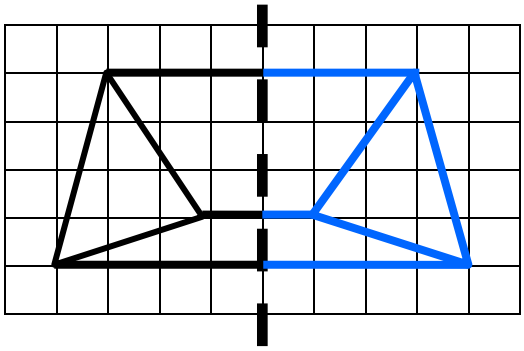
- Diagonals bisect each other (cut in half)



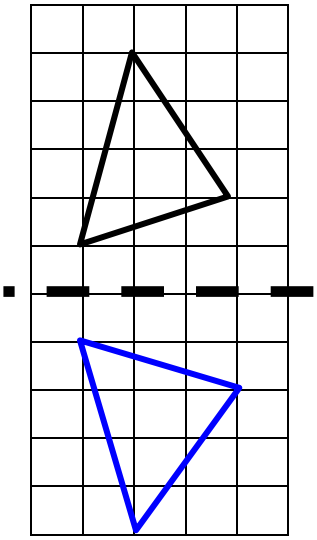
- **A square is a special rectangle**

28 Reflection

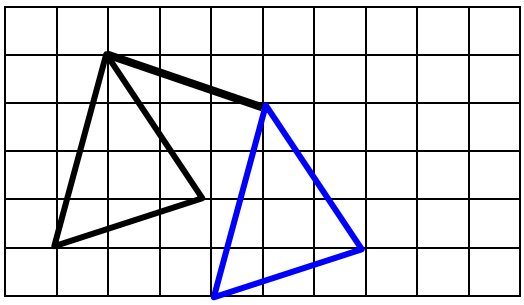
- **Reflection in a vertical line**



- **Reflection in a horizontal line**



5/28 Translation – 3 right & 1 down

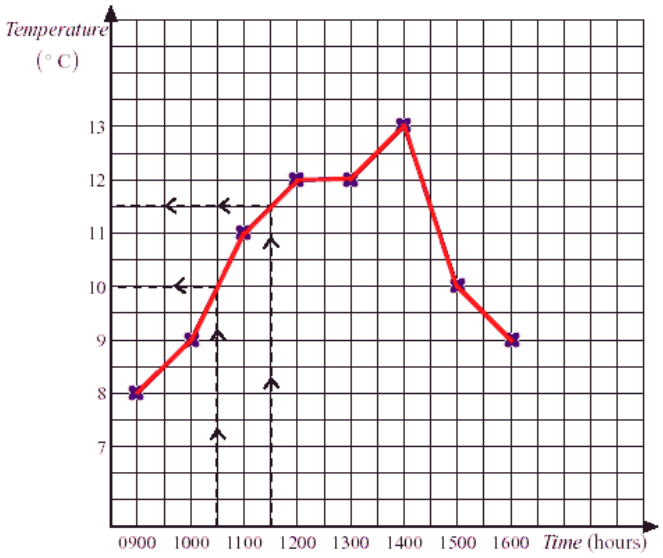


- In reflection and translation the shapes remain the same size and shape – CONGRUENT
- In reflection the shape is flipped over
- In translation the shape stays the same way up

29 Line graphs

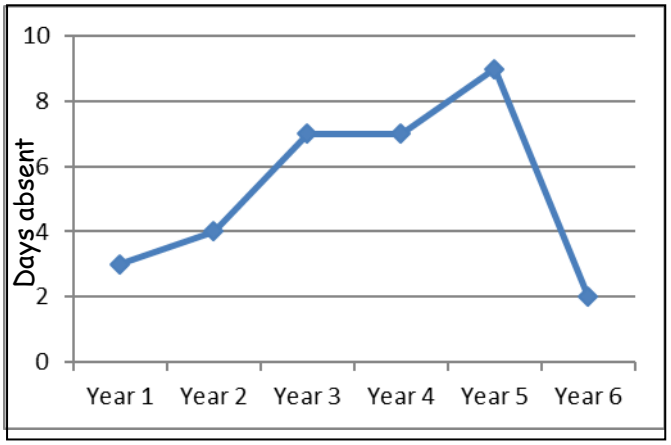
- **Find the difference**

Example 1 : What was the difference in temperature between 1030 and 1130?
Answer: $11.5^0C - 10^0C = 1.5^0C$



- **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



30 Interpret information in tables

- **Distance table**

Example: Find the distance between **Leeds** and **York**
Answer: 40miles

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

- **Timetable**

Example: How long is the film?
Answer: 1.10 – 2.35 = 1h 25min = 85min

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