

# Maths Minder

## Number Extras

**Factors:** All the numbers that divide exactly into that number.

Factors of 8 are 2 4 8 1

**PRIME** Numbers: Numbers that only have 2 factors- 1 and the number itself.

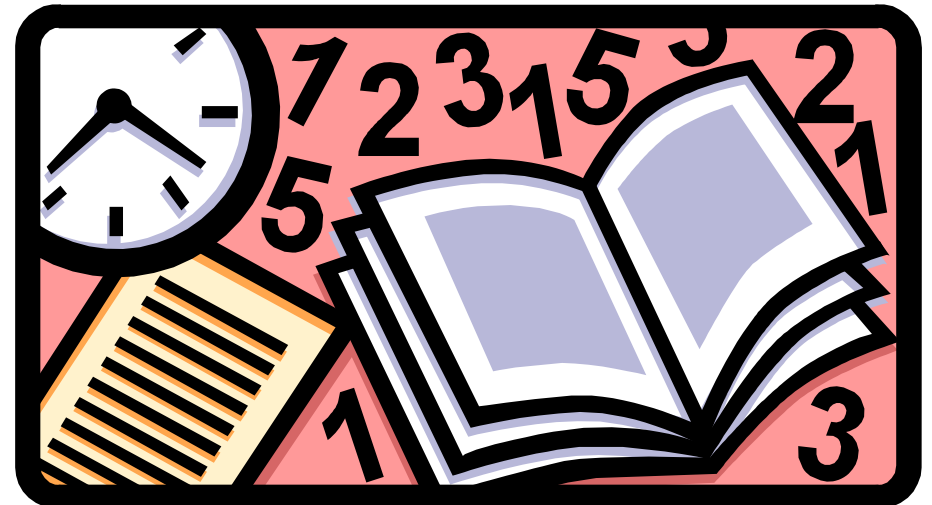
Eg 3, 5, 7, 11,

**SQUARE** Numbers: A number multiplied by itself:

3 squared :  $3 \times 3 = 9$

A helpful little book of SATS hints

Name:.....



## Problem Solving:

**1. Underline key words**

**2. Decide which operation:**

**+ - x or ÷**

**3. Estimate**

**4. Calculate**

**5. Check**

**6. Answer with correct unit.**

## Key Advice: Learn These

	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	54	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

**KNOW YOUR TABLES: A daily session to keep sharp will make you a confident mathematician. VLE available to help.**

## Addition

Learn your number facts e.g. pairs of numbers that add to 10, 100, and 1000

How to add:

1. **Partitioning** the number into hundreds, tens and units.  
Add the tens first, starting with the larger number and then the units:

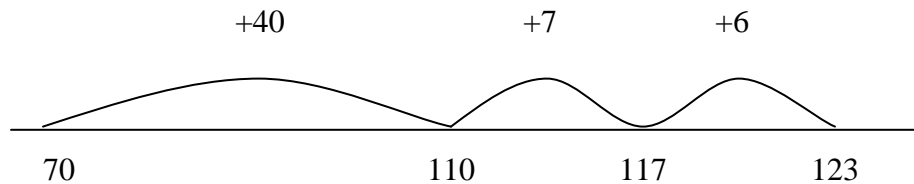
$$36 + 27 = 30 + 6 \text{ and } 20 + 7$$

$$= 30 + 20 \text{ and } 7 + 6$$

$$= 50 \text{ and } 13 \text{ (could partition 13 into 10 and 3)}$$

$$= 63$$

Use number lines to record and to help work out these calculations e.g.  $76 + 47$



2. **Vertical layout:**

$$\begin{array}{r} \text{A} \quad 47 \\ + 76 \\ \hline 110 \text{ (70+40)} \\ 13 \text{ (7+6)} \\ \hline 123 \end{array}$$

$$\begin{array}{r} \text{B} \quad 368 \\ + 495 \\ \hline 700 \text{ (300+400)} \\ 150 \text{ (90+60)} \\ \hline 13 \text{ (8+5)} \\ \hline 863 \end{array}$$

3. **Advanced layout:**

In examples C and D, start to add the units first, followed by the tens and hundreds.

$$\begin{array}{r} \text{C} \quad 47 \\ + 76 \\ \hline 13 \text{ (7+6)} \\ 110 \text{ (40+70)} \\ \hline 123 \end{array} \qquad \begin{array}{r} \text{D} \quad 368 \\ + 495 \\ \hline 13 \text{ (8+5)} \\ 150 \text{ (90+60)} \\ \hline 700 \text{ (300+400)} \\ \hline 863 \end{array}$$

4. **Vertical layout**, contracting the working to a compact efficient form:

$$\begin{array}{r} 47 \\ + 76 \\ \hline 123 \\ \hline 11 \end{array} \qquad \begin{array}{r} 368 \\ + 495 \\ \hline 863 \\ \hline 11 \end{array}$$

5. Only for Level 5 mathematicians. Now try with larger numbers and decimals

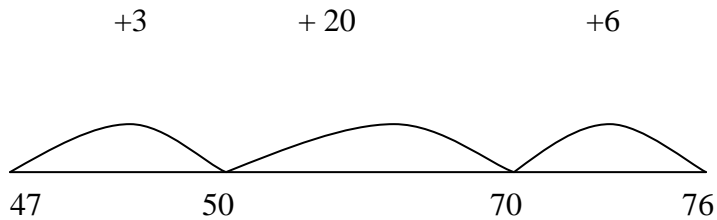
## Subtraction

1. **Subtraction as taking away** (e.g. to take 2 from 7, use 7 objects, take 2 away and count how many are left).
2. **Counting back** (e.g. start at 7 using a number line count back 2 hops).

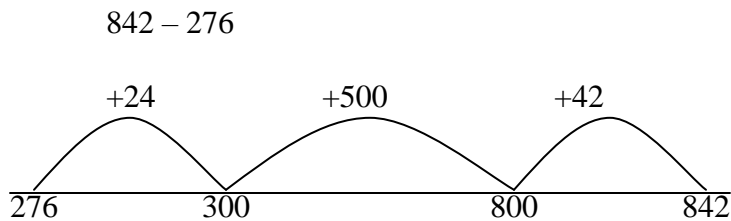
Learn your number facts: e.g. learning the corresponding subtractions to addition pairs of numbers e.g. If you learn that  $5 + 3 = 8$ , you also know that  $8 - 5 = 3$  and  $8 - 3 = 5$ .

3. **Mental method** – counting up (complementary addition):

E.g.  $76 - 47$



$$3 + 20 + 6 = \mathbf{29}$$



$$24 + 500 + 42 = \mathbf{566}$$

4. Vertical layout of complementary addition

For example:

$$\begin{array}{r} 842 \\ -276 \\ \hline \end{array} \qquad \begin{array}{r} 4 \text{ (280)} \\ 20 \text{ (300)} \\ + 542 \text{ (842)} \\ \hline 566 \end{array}$$

Count on from 276 and add on 4 to get to 280.

Add 20 to get to 300.

Now add 542 to get to 842.

Finally add together 4, 20, and 542 to obtain the answer 566.

## Multiplication

You need to :

- 1.Count in steps
2. Use doubling and halving
3. Use an array: eg

$$4 \times 2 = 8$$

$$2 \times 4 = 8$$

4 lots of 2, and 2 lots of 4.

## Know your tables.

4.Mental method using partitioning to multiply a multiple of 10 by a single digit number.

$$38 \times 7 = (30 \times 7) + (8 \times 7)$$

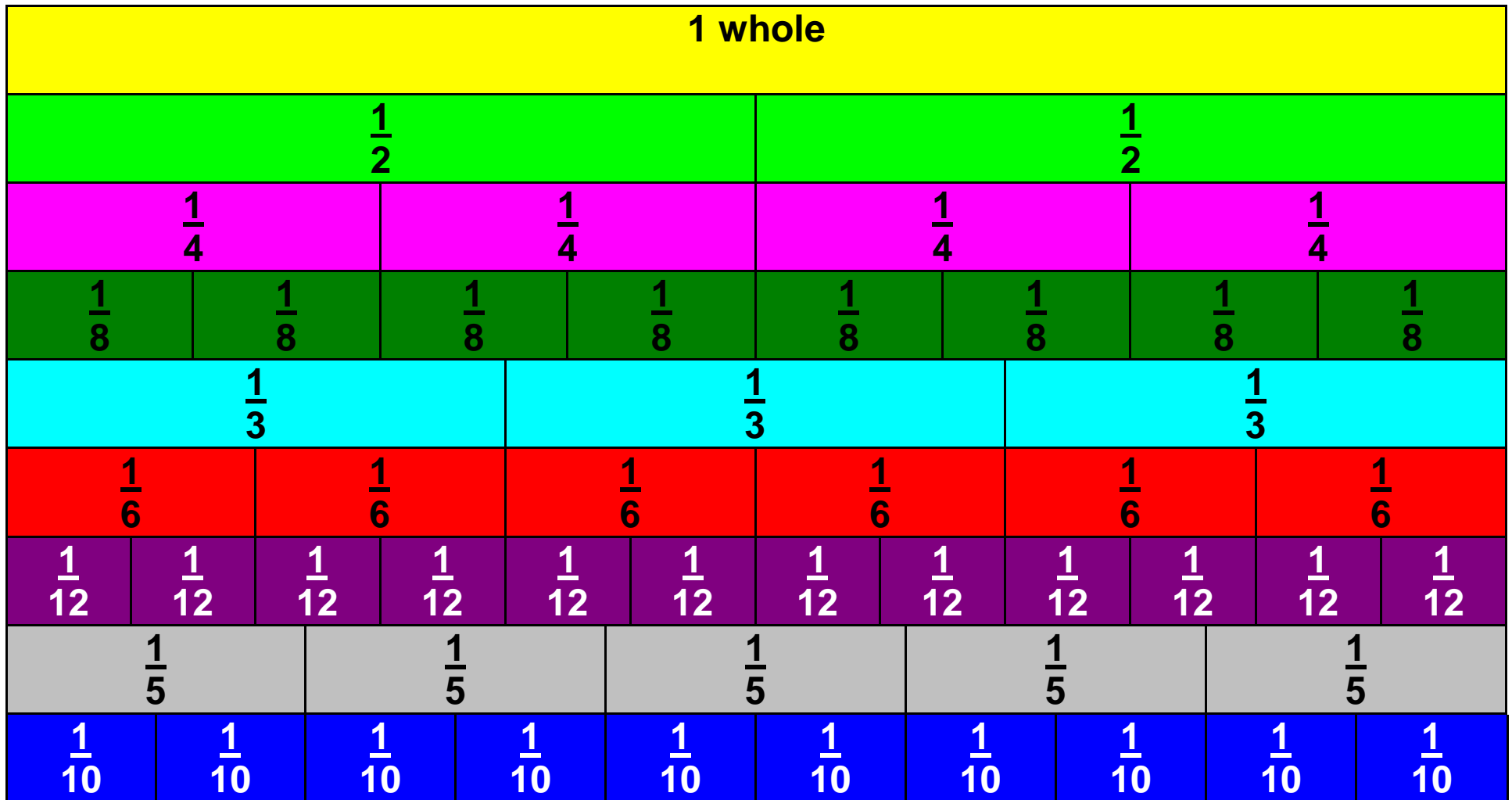
Partition 38 into 30 and 8. They would then multiply 30 by 7, and 8 by 7. Finally add the two answers.

5. Grid layout

X	30	8	
7	210	56	266

Larger number grids:

X	50	6	
20	1000	120	1120
7	350	42	392
			1512



**Fraction Wall**

**Look carefully at the sizes  
of the fractions**

# Calculations

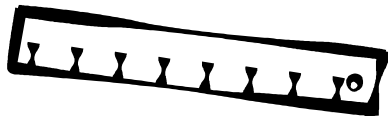


1. Can I do it in my head?

2. Do I need to make a jotting or draw a number line?



3. Do I need a pencil and paper method?



4. Should I use a calculator?

Whatever method feels safe to you is OK.

Calculations which are good on a number line:

Addition

Subtraction

Multiplication

Division

AND

TIME



Don't forget temperature on a vertical line

Useful measurements:

### Liquid:



1 Litre = 1000 millilitres  
1L=1000ml

### Mass

1 Kilogram=1000grams  
1kg=1000g



0.5 kg == 1/2 kg  
0.25kg=1/4 kg  
0.75kg=3/4 kg

### Length

kilometre = 1000 metres  
1metre = 100centimetres  
10 cm = 100mm  
1cm=10 mm



### Money

One Pound =100 pennies  
£1 = 100p

50p= £0.50 pound  
25p= £0.25 pound  
75p= £0.75 pound

10x 10p = £1

20px5= £1

10% of one pound is 10p  
50% of one pound is 50p



## Time



One year = 365 days

One leap year 366 days

30 days hath September

April June and November

All the rest have 31

Excepting 28 in February

And 29 in a leap year.

12 months in a year

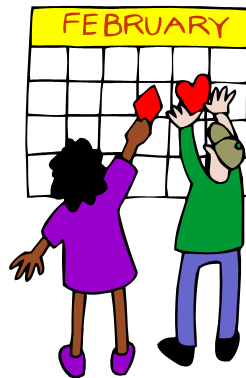
A fortnight is 2 weeks

Seven days in a week

24 hours in a day

60 minutes in an hour

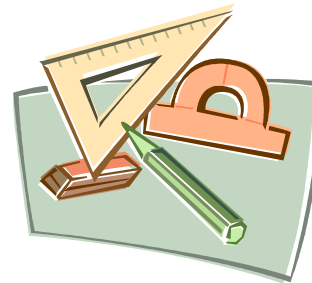
60 seconds in a minute



## Useful Maths Language

### Angles

angles are formed when 2 straight lines meet. Different sized angles have different names.



**Acute** angles are angles smaller than 90 degrees

**Right** angles are 90 degrees

**Obtuse** angles are larger than 90 degrees but smaller than 180 degrees.

**Reflex** angles are larger than 180 degrees but smaller than 360 degrees.

### Area

the amount of surface space in a shape. Measured in squared centimetres or  $\text{cm}^2$

### Average

is the same a **mean**

### Calculate

to work out

### Capacity

the amount that something can hold. It can be measured in litres, millilitres or in cubic centimetres e.g.  $100\text{cm}^3$

### Century

a hundred, A century in time is 100 years

**Decade** Ten years

**Degree** the unit of measurement we use for measuring angles and temperatures

**Difference** to find the difference between 2 numbers, you need to take the smaller number away from the larger one. E.g. the difference between 10 and 4 is 6

**Equilateral triangle** a triangle with sides of equal lengths and equal angles (60 degrees)

**Factors** A factor is a whole number which will divide exactly into another whole number. E.g. 3 is a factor of 12

**Inverse operation** If you have a sum with a missing gap, you can use the inverse operation to solve it. E.g. + and – are the inverse of each other and x and ÷ are the inverse of each other  
To solve  $124 + \square = 200$  you could turn it to  $200 - 124 = 76$

**Mean** To find the mean you must have a set of results. You then need to find the total of the results and divide it by the number of results you have,  
  
e.g. Here are a set of test marks  
Paul 22, Sally 26, Tim 31, David 33

To find the mean of these scores add them all together (112) and then divide by 4 (28) so the mean score is 28

**Median** When the data is arranged in order of size the median is the one in the middle.

**Mode** Is the number which appears most frequently in a collection of data.

**Multiple** Multiples are whole numbers that a larger number can be made of by adding lots of the smaller number together. E.g. 12 is a multiple of 3

**Percentages** % means out of 100 so 20% is the same as 20/100. To find 20% of 50 you divide by 100 and times by 20

**Prime numbers** are numbers which will divide exactly only by themselves and 1. These are the prime numbers to 30  
1 2 3 5 7 11 13 17 19 23 29.

**Product** The answer when something has been multiplied. e.g. the product of 3 and 4 is 12

**Scalene triangle** A triangle with no equal sides

**Square number** The total when a number is multiplied by itself. E.g.  $1 \times 1 = 1$ ;  $2 \times 2 = 4$ ,  $3 \times 3 = 9$   
Square numbers to 100 are  
1 4 9 16 25 36 49 64 81 100

**Sum**                    **To find the sum of a group of numbers, you add the numbers together.**

**Do you know what these mean?**

units	tens	
hundreds	thousands	
ten thousand		
greater than		
less than	too few	
too many	round up	
round down		
roughly		
approximately		
add	plus	more
increase	decrease	
total	subtract	
minus	take away	
difference between		
double	half	
lots of	groups of	
times	multiply	share
divide	remainder	
product	factor	
repeated addition		

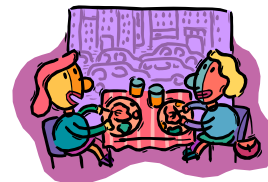
What operations are you going to use?  
What method are you going to use?  
What equipment will you need?  
What questions will you need to ask?  
How are you going to record your answers?  
Can you estimate or predict the answer?

**Finally: Our advice for Sats week is:**

**Prepare by studying**

**Sleep well and soundly**

**Eat well and frequently**



## Division:

Understanding division as grouping, sharing or repeated subtraction.

### 1. Grouping

$$12 \div 3$$

How many groups of 3 are there in 12?

o o o   o o o   o o o   o o o

Answer = 4

### 2. Sharing

$$12 \div 3$$

What is 12 'shared between' 3?

.....

### 3. Beginning to use Repeated Subtraction

$$12 \div 3$$

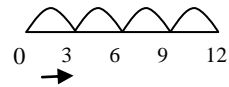
$$12 - 3 - 3 - 3 - 3 = 0$$

Understanding division as grouping, sharing or repeated subtraction.

Using the  $\div$  and = signs, recording horizontally  $12 \div 3 = 4$

### 4. Introducing Number Line Division

$$12 \div 3$$

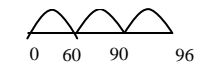


Answer = 4

### Using Number Line Division

How many 6s are there in 96?  $96 \div 6$

$$10 \times 6 \quad 5 \times 6 \quad 1 \times 6$$



So  $96 \div 6 = 16$

### 5. Beginning to use Chunking Method

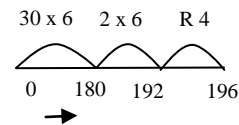
$$192 \div 8$$

$$\begin{array}{r} 8 \overline{)192} \\ \underline{80} \quad (10 \text{ lots of } 8) \\ + \underline{80} \quad (10 \text{ lots of } 8) \\ 160 \\ + \underline{24} \quad (3 \text{ lots of } 8) \\ 184 \\ + \underline{8} \\ 192 \end{array}$$

Answer = 24 (lots of 8)

### 6. Using Number Line Division, with remainder

$$196 \div 6$$



Answer = 32 r 4

### 6. If ready, present in Standard Format

$$196 \div 6$$

$$\begin{array}{r} 6 \overline{)196} \\ \underline{160} \quad (20 \text{ lots of } 6) \\ + \underline{32} \quad (6 \text{ lots of } 6) \\ 192 \end{array}$$

Answer = 24 r 6

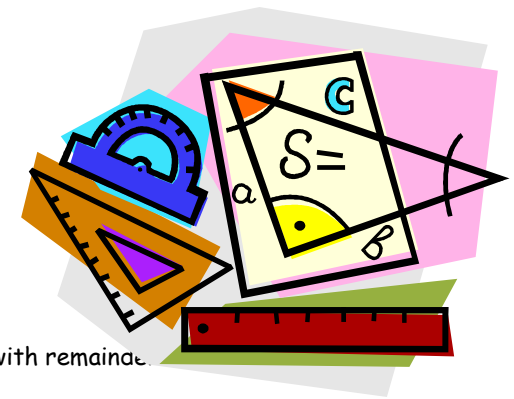
OR  $24 \frac{6}{8}$  OR  $24 \frac{3}{4}$

Using Number Line Division with remainders as decimals when appropriate

$$194 \div 8$$

### 7. If ready, present in Standard Format with a focus on language.

$$\begin{array}{r} 8 \overline{)194} \\ \underline{160} \quad (20 \text{ lots of } 8) \\ + \underline{32} \quad (4 \text{ lots of } 8) \\ 192 \\ + \underline{1.6} \quad (0.2 \text{ lots of } 8) \end{array}$$



$$\begin{array}{r}
 193.6 \\
 + \frac{0.4}{194} \text{(0.05 lots of 8)} \\
 \hline
 194 \\
 \text{Answer} = 24.25
 \end{array}$$

# Pictograms

Our Primary School held a vote to decide on a name for their new school mascot.

This table shows the results

Name	Tally	Total
Joey		45
Fuzzy		10
Oggy		

Dina		
------	--	--

- Complete the table.
- Complete this pictogram

Name	Symbol
Joey	
Fuzzy	
Oggy	
Dina	

- What is the value of ? \_\_\_\_\_

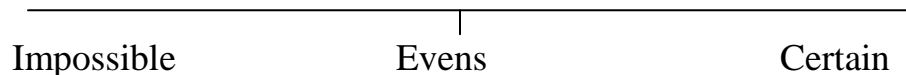
**Remember you must look at the key to find out how much is represented by each symbol in the pictogram**

## Probability Vocabulary

perhaps, might, fair, unfair, likely, unlikely, equally likely, chance, certain, uncertain, probable, possible, impossible, good chance, poor chance, no chance, equal chance, even chance, evens, fifty- fifty, likelihood, probability, possibility.

Try them out:

- I will go on holiday for 2 weeks next year.
- If I drop a piece of toast, it will land butter side down.
- I will get a 'head' when I toss a coin.
- When I get home, Mum will tell me we are going to McDonalds for tea
- It will rain tomorrow.
- The sun will rise next week.
- I will win the lottery.



|

0	$\frac{1}{2}$	1
0	0.5	1
0%	50%	100%

## Mean, Median, Mode and Range

Mean

The mean is when all the numbers are added then divided by how many numbers there were eg:

**The mean of 12, 17, and 15 is**

$$12+19+15=36$$

$$\text{Mean} = 36 \text{ divided by } 3 = 12$$

**Median**

The median is the middle or an ordered set of numbers eg  
1,3,6,13,21,23,26 The median is 13



**Mode**

The group which is **largest** is the mode. If for examples, car colours are being compared and this information is collected:

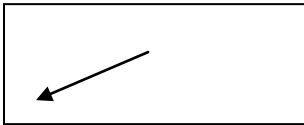
White 12; Black 14; Red 12; Blue 9; Green 11

Then **the mode is black** because more black cars were owned than any other colour.

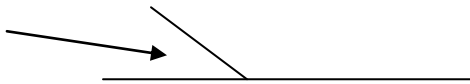
The **range** is **the difference between the highest and the lowest value of the thing being measured**. e.g. if the most number of times a week a child reads to a parent is 7, and the least is 1, the range is 6 ( $7 - 1$ ).

## Angles

An angle at  $90^\circ$  is a special angle called a **right angle**.



**Remember** – small angles (less than 90 degrees) are called ACUTE angles (a cute angle)

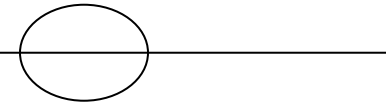


- angles bigger than (90 degrees), but less than 180 degrees are called OBTUSE angles.



Total 360 degrees

4 right angles  
360 degrees



4 lots of 90 degrees  
2 lots of 180 degrees

## Properties of Triangles

**Isosceles** triangles have 2 equal sides and 2 equal angles .

**Scalene** Triangles have no equal sides and no equal angles. One angle is larger than 90 degrees

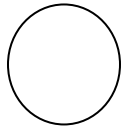
**Equilateral** Triangles have 3 equal sides and 3 equal angles.

# Shape Vocabulary

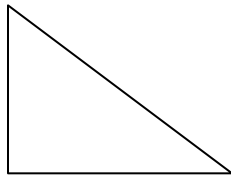
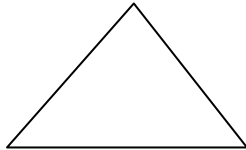
## 2 Dimensional shapes:

polygons – closed,  
flat, shapes with more than  
3 straight sides

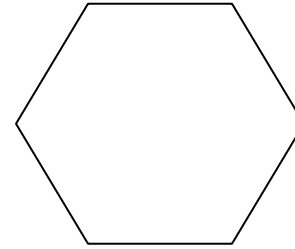
circle oval  
triangles:



[3 sides] equilateral  
isosceles  
right-angle  
scalene  
quadrilaterals  
[4 sides] square  
oblong  
rectangle  
parallelogram  
rhombus  
trapezium



chevron  
pentagon 5  
hexagon 6  
heptagon 7  
octagon 8  
nonagon 9  
decagon 10  
dodecagon 12



## 3 Dimensional shapes:

cube  
cuboid



pyramid  
tetrahedron – triangle base  
pyramid

square base pyramid  
prism



cylinder



cone  
sphere  
semi-sphere  
ovoid  
decahedron  
dodecahedron





**icosahedron**  
**face edge vertex**  
**angles vertices**  
**triangular circular**  
**pentagonal curved**  
**hexagonal shape**


**Place Value**

1. Circle the number which is **nearest in value to 750**.

 699      810      852      1050

2. Write these numbers in **order of size**.

456      299      901      472  
575



--	--	--	--	--

  
Smallest

3. Here are three number cards.

4	7	6
---	---	---

Write down the **smallest** number you can make using the three cards

 \_\_\_\_\_

Write down the number **closest to 754** you can make using the **three** cards.

 \_\_\_\_\_

4. Which of these numbers is **nearest to 400**?

310      530      460      370      420

5. Here are three digits.

**6                      1                      3**

Use **all** the digits **6, 1** and **3** to write a number that is **between 100 and 140**.



--	--	--

Use all the digits **6, 1** and **3** to complete this **subtraction**.



		—		=	25
--	--	---	--	---	----

6. Circle the **two** numbers which add up to **1**.



0.1      0.65      0.99      0.45      0.35

Here are four number cards.

2	7	6	9
---	---	---	---

Use all the number cards to make an addition  
 The answer must be **MORE that 100**



$$\begin{array}{r}
 \square \square \\
 + \\
 \square \square \\
 \hline
 \end{array}$$

Ordering Decimals

0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.2
0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.3
0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.4
0.41	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.5
0.51	0.52	0.53	0.54	0.55	0.56	0.57	0.58	0.59	0.6
0.61	0.62	0.63	0.64	0.65	0.66	0.67	0.68	0.69	0.7
0.71	0.72	0.73	0.74	0.75	0.76	0.77	0.78	0.79	0.8
0.81	0.82	0.83	0.84	0.85	0.86	0.87	0.88	0.89	0.9
0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99	1

Remember the Decimal Point **NEVER** Moves

To multiply by 10 the numbers move one place to the left: Don't forget the place holders



To Divide by 10 the numbers move one place to the right



Negative Numbers

Think Number Line

10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
0  
-1  
-2  
-3  
-4  
-5  
-6  
-6  
-8  
-9

**-10**

Shapes which are the same and fit together with no gaps.

Transformations:

- Reflection
- Translation, whole shape slides
- Rotation: Shape turns around central point.

## **Measuring Shape**

### **Perimeter:**

Take a walk around the shape and add up how far you go.

Or If it is a quadrilateral shape:

$$P = 2l + 2b$$

### **Area:**

How much space does the shape take up?

Count the squares. Or

$$A = 2(l + b)$$

Symmetry: The same both sides

Rotational Symmetry:

A shape turned through 90 degrees, 180 degrees or 270 degrees.

Tessellation: