

Band 3 Knowledge Organiser

3/1 Count in multiples

Now you must learn these multiples

Multiples of 4	Multiples of 8	Multiples of 50	Multiples of 100
0	0	0	0
4	8	50	100
8	16	100	200
12	24	150	300
16	32	200	400
20	40	250	500
24	48	300	600
28	56	350	700
32	64	400	800
36	72	450	900
40	80	500	1000

hundreds	tens	ones
3	5	2

- To find 10 more or 10 less, it is the 'tens digit' that changes
10 more than 352 becomes 362
10 less than 352 becomes 342

hundreds	tens	ones
3	5	2

- To find 100 more or 100 less, it is the 'hundreds' digit that changes
100 more than 352 becomes 452
100 less than 352 becomes 252

3/2 Recognise place value

hundreds	tens	ones
3	5	2

352 means 300 + 50 + 2

3/3 Numbers in words and figures

In order to put FIGURES into WORDS, we must try to imagine that the number is in a PLACE VALUE table like this one

Hundred	Ten	One
1	4	7
One hundred	forty	seven
One hundred and forty-seven		

Hundred	Ten	One
4	0	9
Four hundred		nine
Four hundred and nine		

3/3 Compare and order numbers

- Write numbers lining up the digits

Hundred	Ten	One
1	4	7
6	3	2
1	7	6
1	6	2

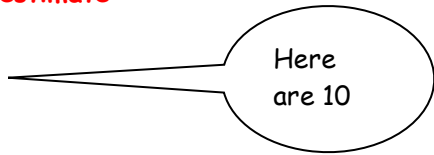
- Begin at the hundreds and compare
632 is the biggest

Hundred	Ten	One
1	4	7
6	3	2
1	7	6
1	6	2

- Move to the tens and compare
Order is: 632, 176, 162, 147

3/4 Estimating

- **Eyeball estimate**



Use this to estimate larger quantities



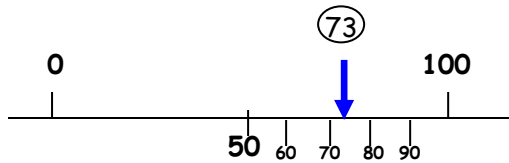
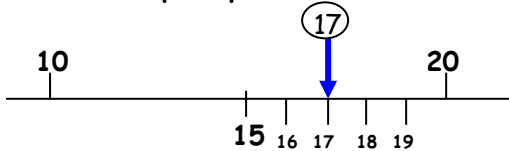
- **Estimate by sampling**



Count your pulse over 15 seconds
 Multiply the number of pulses by 4 to get the pulse rate over 1 minute ($15 \times 4 = 60$ seconds)

- **Estimate on a number line**

Fill in the half way number first
 Then split up the half with the arrow



- **Estimate by rounding off a number**

To make a sum easier and give a rough answer

Example: 28 could be rounded to 30
 £1.95 could be rounded to £2

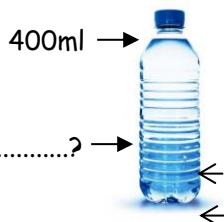
3/5 Solve problems by estimating

Example: Estimate the cost of 5 magazines at £1.95 each



Answer: It is about $5 \times £2 = £10$

Example: When full this bottle holds 400ml.
 Estimate how much water is left in this bottle.



Answer: about 150ml

3/6 Add 3 digit numbers mentally

Partitioning

$$236 + 319$$

$$\begin{aligned} & \leftarrow \leftarrow \leftarrow \leftarrow \leftarrow \\ & 200 + 30 + 6 + 300 + 10 + 9 \\ & = 500 + 40 + 15 \\ & = 555 \end{aligned}$$

Subtract 3 digit numbers mentally

$$363 - 126$$

Partitioning

$$\begin{aligned} & \leftarrow \\ & 363 - 100 - 20 - 6 \\ & = 263 - 20 - 6 \\ & = 243 - 6 \\ & = 237 \end{aligned}$$

Counting on from 126

$$\begin{aligned} & 126 + 4 \\ & 130 + 3 \\ & 133 + 230 \\ & = 363 \\ & \text{Answer} = 237 \end{aligned}$$

3/7 Written method for addition

- **Line up the digits in the correct columns**

e.g. $132 + 239$

	H	T	O
	1	3	2
	2	3	9
+		1	
	3	7	1

Written method for subtraction

- **Line up the digits in the correct columns**

e.g. $327 - 119$

	H	T	O
	3	2	7
	1	1	9
-			
	2	0	8

3/8 Estimate answers to calculations

- Round off each number
- Then do the calculation
- Check using the inverse

Example: Estimate $83 - 28$

$$80 - 30 = 50$$

$$\text{Inverse: } 50 + 30 = 80 \checkmark$$

3/9 Missing number problems

Fact family for +/-

$$34 + 23 = 57$$

$$57 - 23 = 34$$

$$23 + 34 = 57$$

$$57 - 34 = 23$$

3/10 Know the 3, 4 and 8 times tables

1 x 3 = 3	1 x 4 = 4
2 x 3 = 6	2 x 4 = 8
3 x 3 = 9	3 x 4 = 12
4 x 3 = 12	4 x 4 = 16
5 x 3 = 15	5 x 4 = 20
6 x 3 = 18	6 x 4 = 24
7 x 3 = 21	7 x 4 = 28
8 x 3 = 24	8 x 4 = 32
9 x 3 = 27	9 x 4 = 36
10 x 3 = 30	10 x 4 = 40
11 x 3 = 33	11 x 4 = 44
12 x 3 = 36	12 x 4 = 48

1 x 8 = 8
2 x 8 = 16
3 x 8 = 24
4 x 8 = 32
5 x 8 = 40
6 x 8 = 48
7 x 8 = 56
8 x 8 = 64
9 x 8 = 72
10 x 8 = 80
11 x 8 = 88
12 x 8 = 96

Fact family for x/÷

$$9 \times 8 = 72$$

$$72 \div 9 = 8$$

$$8 \times 9 = 72$$

$$72 \div 8 = 9$$

3/11 Multiply

- A 2-digit number by a single digit

Column method

$$\begin{array}{r} \text{T O} \\ 38 \\ 3 \\ \times 2 \\ \hline 114 \end{array}$$

3/12 Multiply & divide

- Look for connections between two sums
- Remember the fact family for x/÷

Example: $6 \times 4 = 24$ So $60 \times 4 = 240$
 So $240 \div 4 = 60$

Example: $9 \times 8 = 72$ So $18 \times 8 = 144$
 So $144 \div 8 = 18$

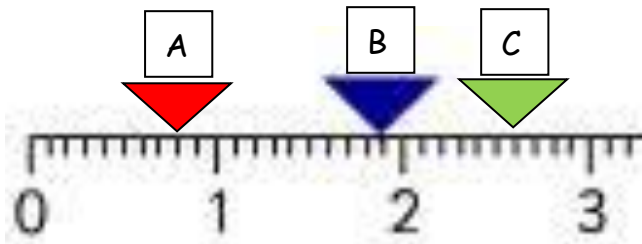
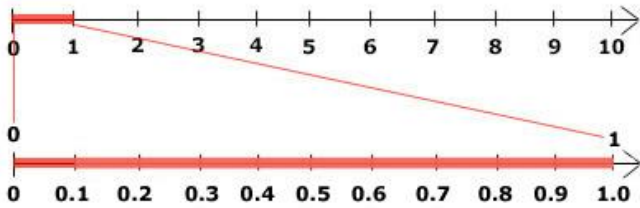
3/13 Tenths

tens	ones	•	tenths
8	2	•	6

- This represents 6 tenths = $\frac{6}{10}$

Counting in tenths (continued)

- A whole one divided into 10 equal parts
- $1 \div 10 = 1$ tenth or $\frac{1}{10}$ Or 0.1



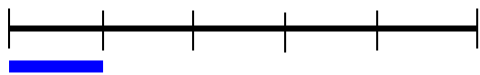
A - 0.8
B - 1.9
C - 2.6

- To find a tenth of an object or quantity you divide by 10

Example: $\frac{1}{10}$ of 20 = $20 \div 10 = 2$

3/14 Fraction of line or objects

- To find $\frac{1}{5}$ of a line
- Divide the line into 5 equal parts



Each part is $\frac{1}{5}$

- To find $\frac{1}{5}$ of a set of objects
- Divide objects into 5 equal parts



Each part is $\frac{1}{5}$

3/16 Equivalent fractions

3/14 Write a fraction of a number of object



$\frac{2}{5}$ are blue and $\frac{3}{5}$ are red

3/15 Use fractions as numbers

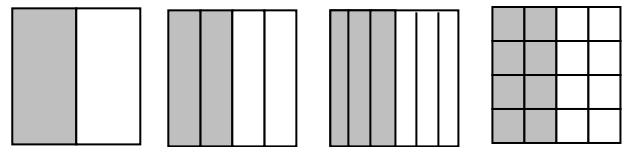
To find $\frac{1}{5}$ of 20 we do $20 \div 5 = 4$

To find $\frac{2}{5}$ of 20 we do $4 \times 2 = 8$

To find $\frac{3}{5}$ of 20 we do $4 \times 3 = 12$

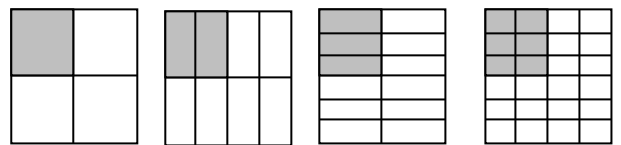
- The same fraction can be expressed in different ways

ALL THESE ARE $\frac{1}{2}$



$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{8}{16}$$

ALL THESE ARE $\frac{1}{4}$



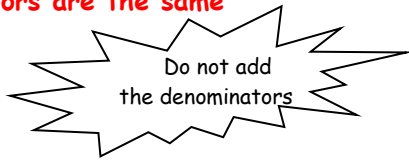
$$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{6}{24}$$

3/17 Add & subtract fractions

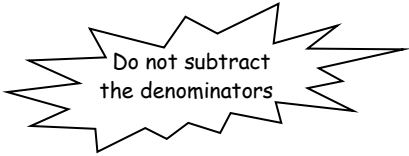
- To add and subtract fractions

When the denominators are the same

$$\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$$

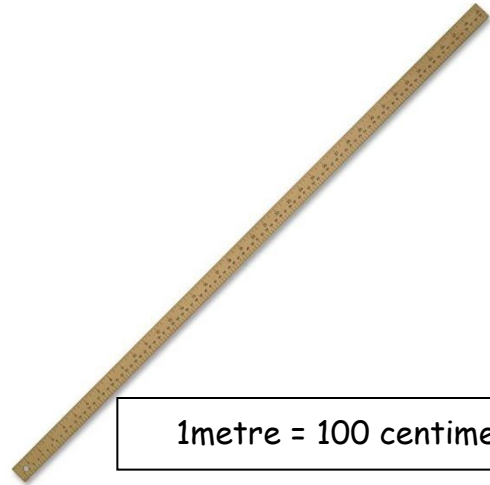


$$\frac{5}{7} - \frac{1}{7} = \frac{4}{7}$$



- The units must be the same

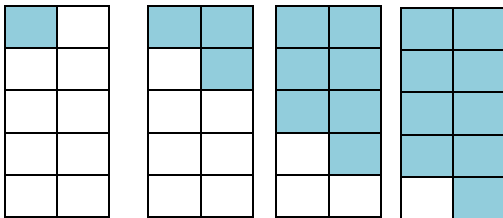
Length - Example



3/18 Compare fractions

- Fractions with the same denominator

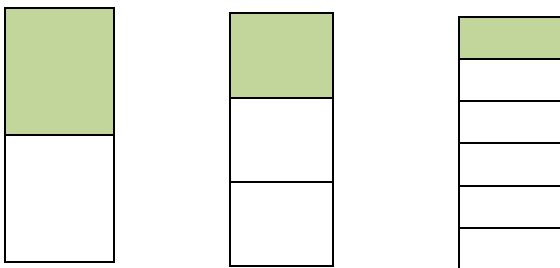
$$\frac{1}{10} \quad \frac{3}{10} \quad \frac{7}{10} \quad \frac{9}{10}$$



The bigger the numerator, the bigger the fraction

- Unit Fractions

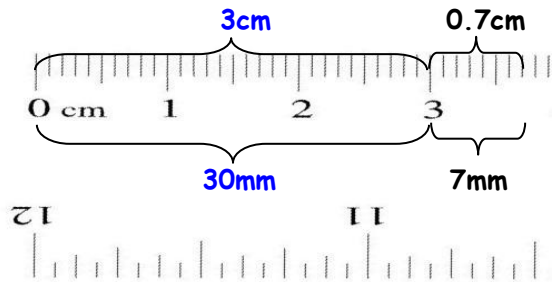
$$\frac{1}{2} \quad \frac{1}{3} \quad \frac{1}{6}$$



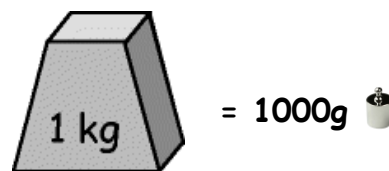
The bigger the denominator, the smaller the fraction



$$\begin{aligned} & 3\text{cm} + 7\text{mm} \\ &= 30\text{mm} + 7\text{mm} \\ &= 37\text{mm} \\ &\text{or } 3\text{cm } 7\text{mm or } 3.7\text{cm} \end{aligned}$$



Mass - Example



$$\begin{aligned} & 3\text{kg} - 450\text{g} \\ &= 3000\text{g} - 450\text{g} \\ &= 2550\text{g} \\ &\text{or } 2\text{kg } 550\text{g or } 2.55\text{kg} \end{aligned}$$

3/19 Add & subtract measures

3/19 Add & subtract measures (continued)

Volume - Example



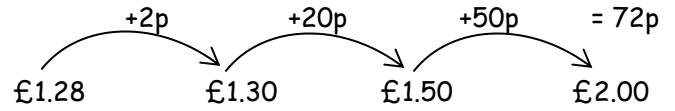
1litre = 1000millilitres



800ml + 720ml
 = 1520ml
 = 1 litre and 520ml
 = 1.52 litres

To work out the cost
 1 chocolate bar - £1.10
 1 pen - 10p
 1 pencil - 8p
 Total = £1.28

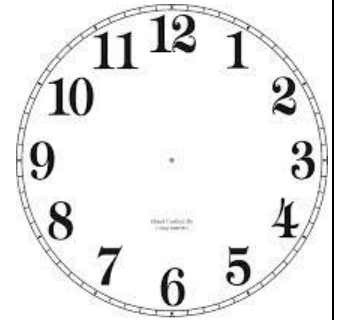
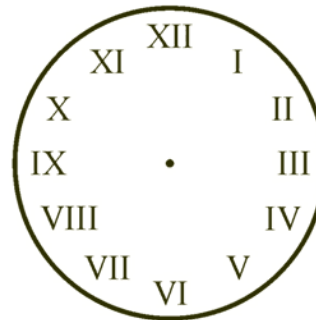
To find change by the 'add-on' method



3/22 Time Analogue clock

Roman

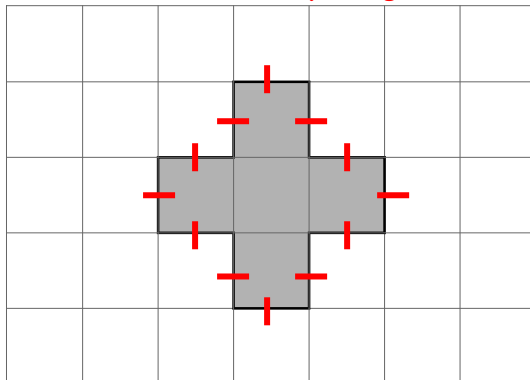
Hindu-Arabic



3/20 Perimeter

PERIMETER is the distance round the outside of a shape

- On a centimetre square grid - count round



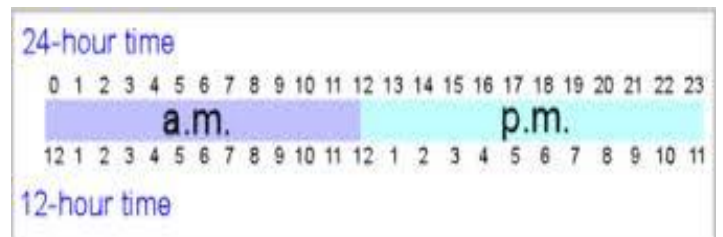
Perimeter of this shape = 12cm

- Measurements given - add up all round



Perimeter of this shape = 6 + 4 + 6 + 4 = 20cm

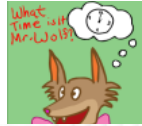
12- and 24-hour clock



3/21 Money and change

3/23 Time

Reading the time

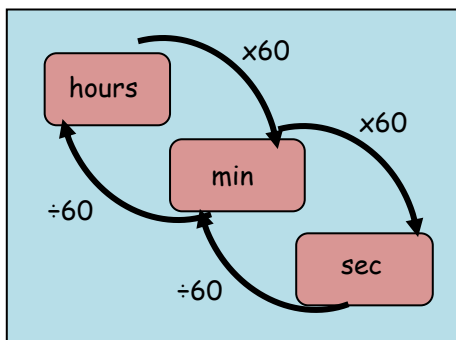


5 minutes between each number- so this time is 1:27 or we say 27 minutes

Times of the day in 12-hour clock

Morning	Afternoon
12.00 midnight	12.00 noon
1.00 am	1.00 pm
2.00 am	2.00 pm
3.00 am	3.00 pm
4.00 am	4.00 pm
5.00 am	5.00 pm
6.00 am	6.00 pm
7.00 am	7.00 pm
8.00 am	8.00 pm
9.00 am	9.00 pm
10.00 am	10.00 pm
11.00 am	11.00 pm
12.00 noon	12.00 midnight

3/24 Time - hours minutes, seconds



Months of the year



- A rhyme to remember the days in each month

30 days has September,
April, June and November.
All the rest have 31
Except February alone,
Which has 28 days clear
And 29 in each leap year.

- the "knuckle method"

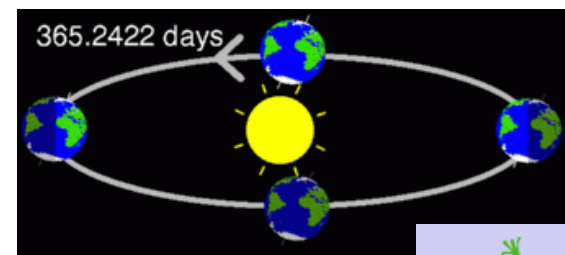


A knuckle is "31 days", and in between each knuckle it isn't.

And where your hands meet, the two knuckles are "July, August", which both have 31 days.

February has 28 days & 29 days in a leap year (every 4 years)

Days in a year



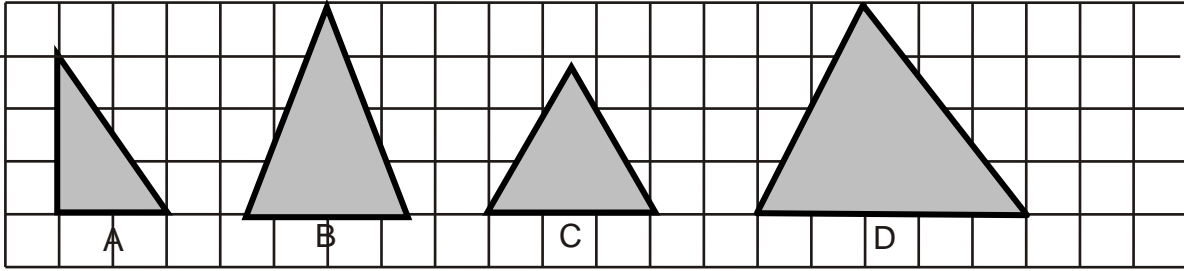
365 days in a year

366 days in a leap year



3/25 - 2D Shapes

• With 3 sides (Triangles)



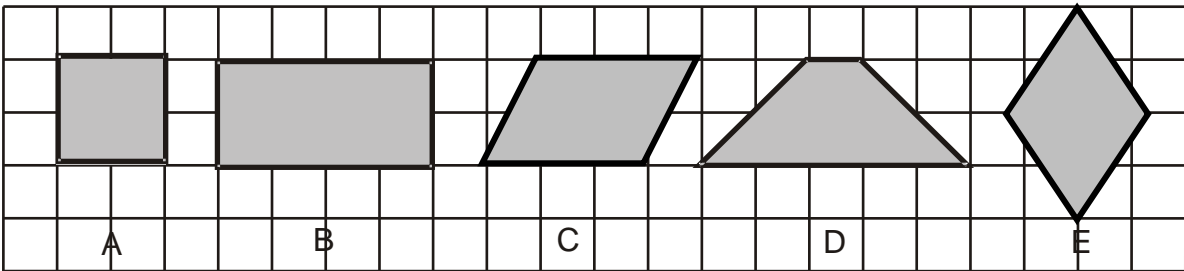
right-angled

isosceles

equilateral

scalene

• With 4 sides (Quadrilaterals)



square

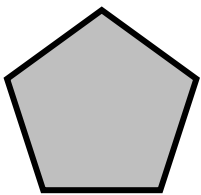
rectangle

parallelogram

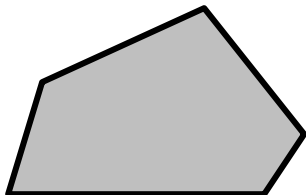
trapezium

rhombus

• With 5 sides (Pentagons)

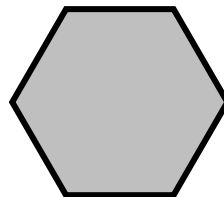


regular

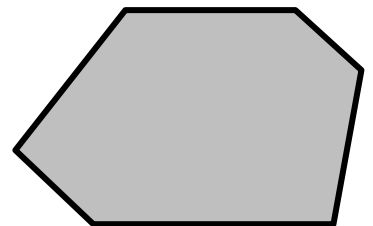


irregular

With 6 sides (Hexagons)

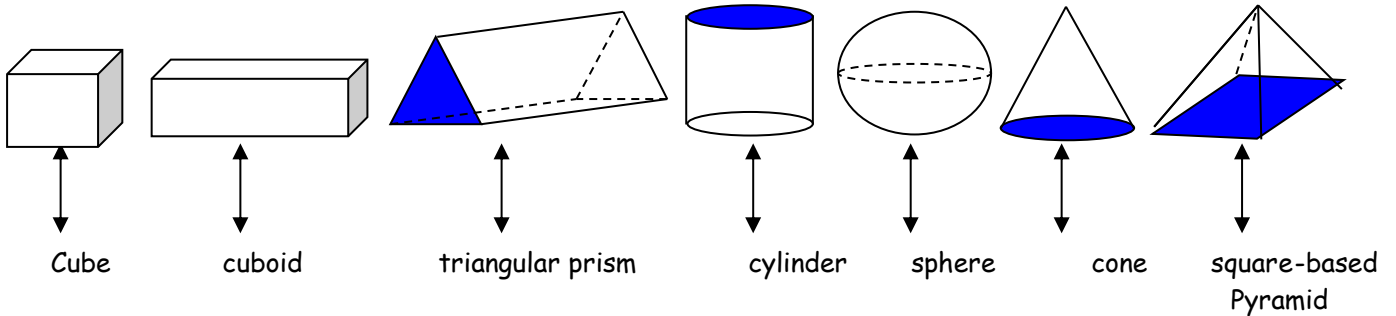


regular

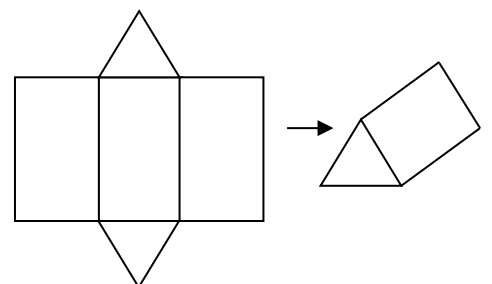
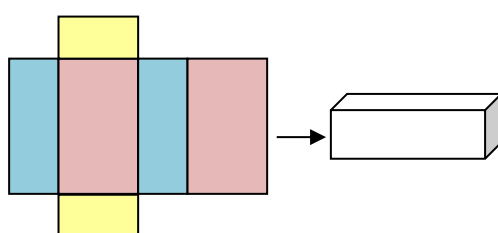
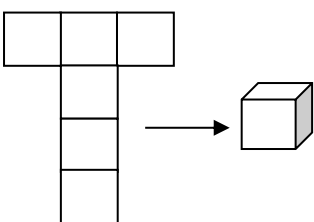


irregular

3/25 - 3D Shapes



- Nets



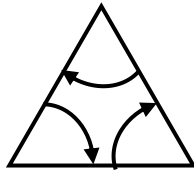
3/26 Angle

- An angle is an amount of turn

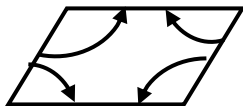


- Angles in shapes

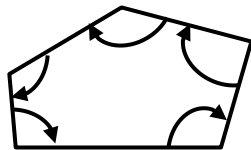
Triangle - 3 angles



Quadrilateral - 4 angles

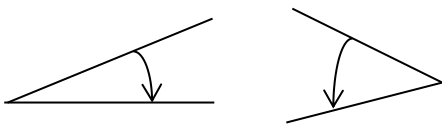


Pentagon - 5 angles

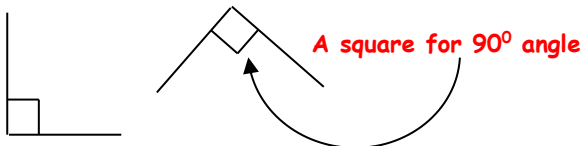


- Names of angles

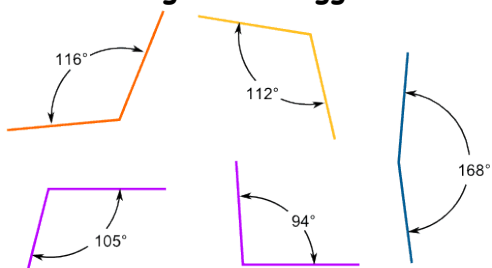
ACUTE angles are less than 90°



RIGHT angles are exactly 90°

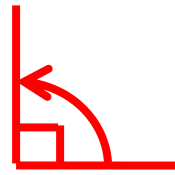


OBTUSE angles are bigger than 90°



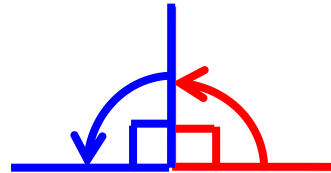
3/27 Right angles

ONE right angle measures exactly 90°



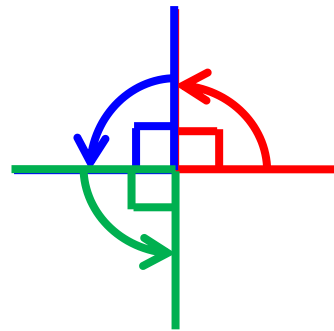
TWO right angles measure exactly 180°

This is called a half-turn



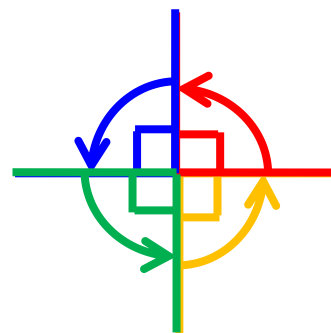
THREE right angles measure exactly 270°

This is called three quarters of a turn

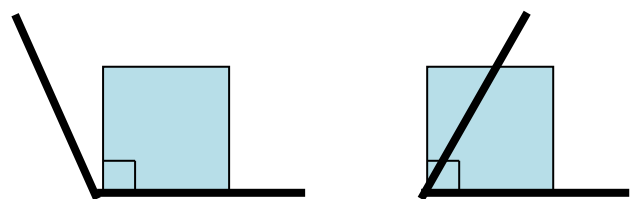


FOUR right angles measure exactly 360°

This is called a full or complete turn



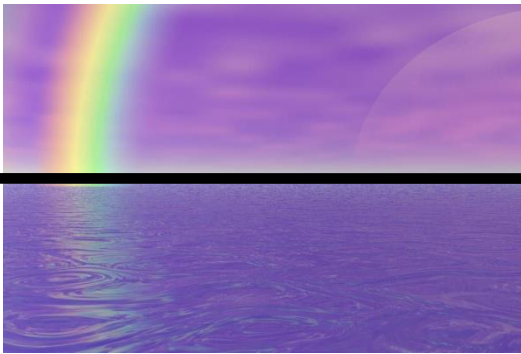
To check if an angle is bigger or smaller than a right angle, use a square corner



This angle is greater than a right angle

This angle is less than a right angle

3/28 Types of Lines



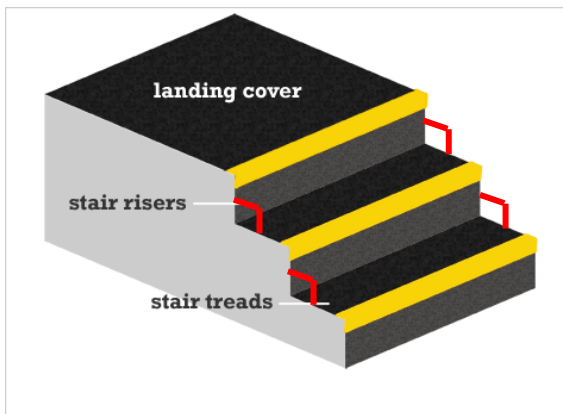
The Horizon is a horizontal line



This cliff face is a vertical line



The running track is parallel lines (never meet)



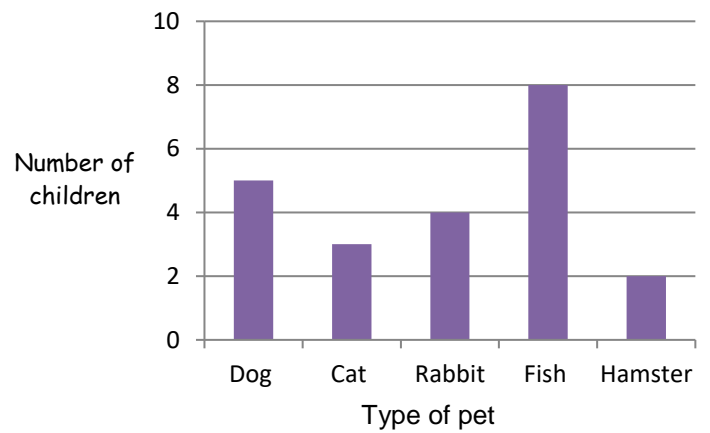
The rise & tread are perpendicular lines (meet at 90°)

3/29 Bar charts

Frequency table to show pets owned by Year 3

Type of pet	Tally	Number of pets
Dog		5
Cat		3
Rabbit		4
Fish		8
Hamster		2

A bar graph to show pets owned by Year 3



Pictogram to show the colours in a tube of Smarties

Colour	Number of Smarties
Green	4 Smarties (3 full, 1 half)
Orange	4 Smarties (4 full)
Blue	3 Smarties (2 full, 1 half)
Pink	3 Smarties (3 full)
Yellow	6 Smarties (5 full, 1 half)
Red	4 Smarties (4 full)
Purple	4 Smarties (3 full, 1 half)
Brown	2 Smarties (1 full, 1 half)
	Key: ● = 2 smarties

3/30 Solve answers to questions

• **Bar chart in 3/29**

- (i) How many **more** children own a rabbit than a hamster?

Answer: $4 - 2 = 2$

- (ii) What is the **difference** between the number of children who own a dog and the number of children who own a cat?

Answer: $5 - 3 = 2$

- (iii) How many pets are owned **altogether** by the children Year 3?

Answer: $5 + 3 + 4 + 8 + 2 = 22$

• **Pictogram in 3/29**

- (i) How many **fewer** blue smarties are there than yellow ones?

Answer: $11 - 5 = 6$

- (ii) Work out the **total** number of smarties in the tube

Answer: 55