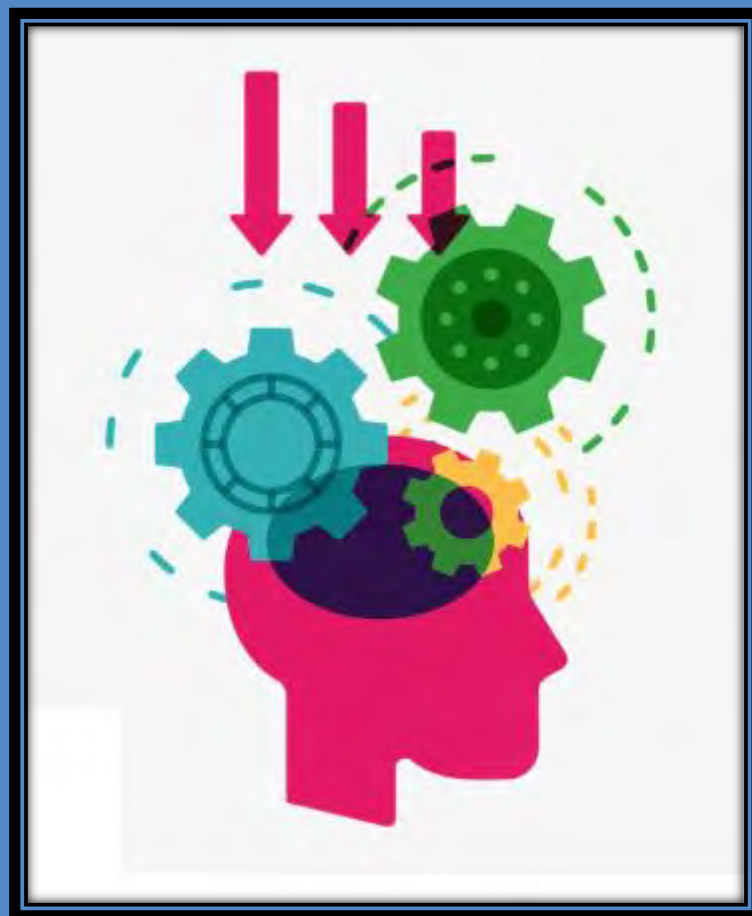


Knowledge organisers

Year 8



Community • Creativity • Achievement



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YEAR 8 - PROPORTIONAL REASONING...

Ratio and Scale

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Simplify any given ratio
- Share an amount in a given ratio
- Solve ratio problems given a part

Solutions should be modelled, explained and solved

Keywords

Ratio: a statement of how two numbers compare

Equal Parts: all parts in the same proportion, or a whole shared equally

Proportion: a statement that links two ratios

Order: to place a number in a determined sequence

Part: a section of a whole

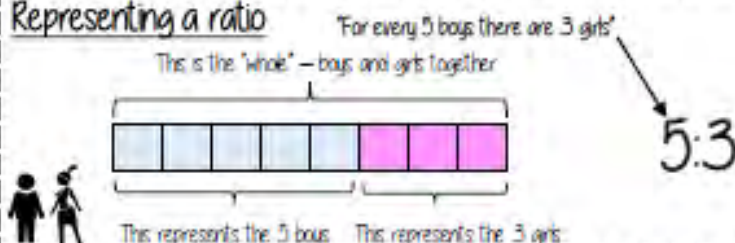
Equivalent: of equal value

Factors: integers that multiply together to get the original value

Scale: the comparison of something drawn to its actual size

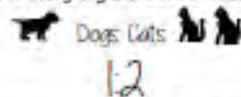


Representing a ratio



Order is Important

"For every dog there are 2 cats"



The ratio has to be written in the same order as the information is given
e.g. 2:1 would represent 2 dogs for every 1 cat. ✗

Simplifying a ratio

"For every 6 days of rain there are 4 days of sun"

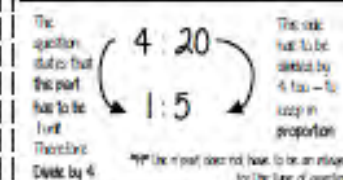


For every 3 days of rain there are 2 days of sun — when this happens twice the ratio becomes 6:4

Ratio In (or n:1)

This is asking you to cancel down until the part indicated represents 1

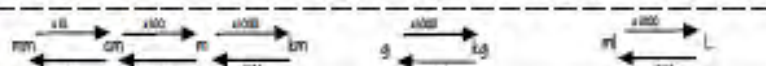
Show the ratio 4:20 in the ratio of 1:n



Units are important

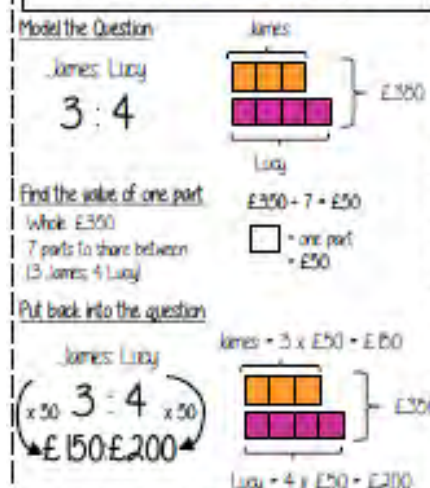
When using a ratio — all parts should be in the same units

Useful Conversions



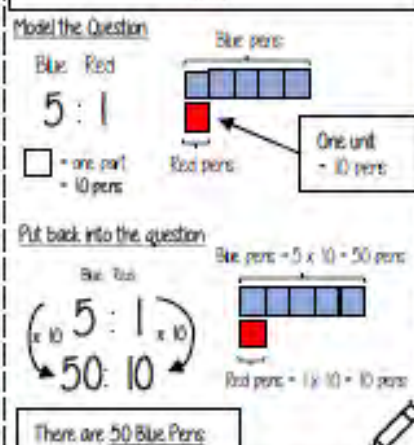
Sharing a whole into a given ratio

James and Lucy share £350 in the ratio 3:4
Work out how much each person gets:

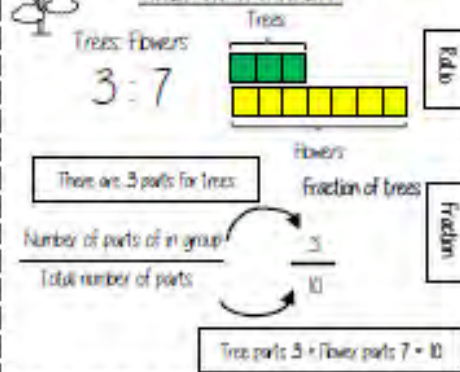


Finding a value given In (or n:1)

Inside a box are blue and red pens in the ratio 5:1
If there are 10 red pens how many blue pens are there?



Ratio as a fraction



YEAR 8 - PROPORTIONAL REASONING...

Multiplicative Change

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Solve problems and explain direct proportion
- Use conversion graphs to make statements, comparisons and form conclusions
- Understand and use scale factors for length

Keywords

Proportion: a statement that links two ratios

Variable: a part that the value can be changed

Axes: horizontal and vertical lines that a graph is plotted around

Approximation: an estimate for a value

Scale Factor: the multiple that increases/ decreases a shape in size

Currency: the system of money used in a particular country

Conversion: the process of changing one variable to another

Scale: the comparison of something drawn to its actual size

Direct Proportion

As one variable changes the other changes at the same rate.



4 cans of pop = £2.40

4 cans of pop = £2.40
2 cans of pop = £1.20

This multiplier is the same in the same way that this would be for ratio

This is a multiplicative change

4 cans of pop = £2.40
12 cans of pop = £7.20

Sometimes this is easiest if you work out how much one unit is worth first
e.g. 1 can of pop = £0.60

Conversion Graphs

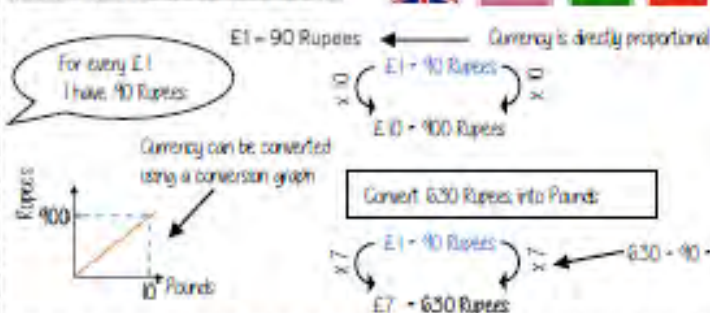
Compare two variables



This is always a straight line because as one variable increases so does the other at the same rate

To make conversions between units you need to find the point to compare - then find the associated point by using your graph.
Using a ruler helps for accuracy.
Showing your conversion lines help as a 'check' for solutions

Conversion between currencies

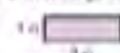


Ratio between similar shapes



Angles in similar shapes do not change
e.g. if a triangle gets bigger the angles can not go above 180°

The two rectangles are similar



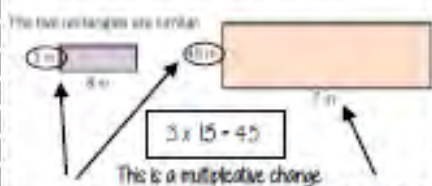
Corresponding sides

3m : 4m
1m : 1.5m

8m : 12m
1m : 1.5m

Note: Simplify to the same ratio

Understand Scale Factor



Use corresponding sides to calculate a scale factor

Scale Factor can also be calculated by:
Bigger corresponding side
Smaller corresponding side

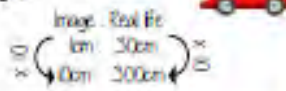


Draw and interpret scale diagrams

A picture of a car is drawn with a scale of 1:30

For every 1cm on my image is 30cm in real life

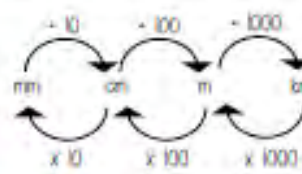
The car image is 10cm



The car in real life is 210cm



Interpret maps with scale factors



1cm = 25000cm

1cm = 250m

For every 1cm on my map is 25000cm in real life



YEAR 8 - PROPORTIONAL REASONING...

Multiplying and Dividing Fractions

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to

- Carry out any multiplication or division using fractions and integers.
- Solutions can be modelled, described and reasoned.

Keywords

Numerator: the number above the line on a fraction. The top number. Represents how many parts are taken.

Denominator: the number below the line on a fraction. The number represents the total number of parts.

Whole: a positive number including zero without any decimal or fractional parts.

Commutative: an operation is commutative if changing the order does not change the result.

Unit Fraction: a fraction where the numerator is one and denominator a positive integer.

Non-unit Fraction: a fraction where the numerator is larger than one.

Dividend: the amount you want to divide up.

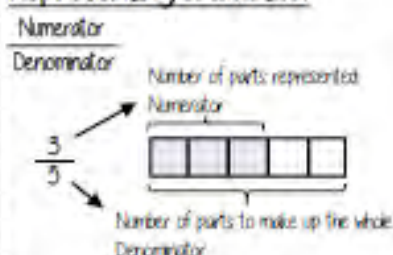
Divisor: the number that divides another number.

Quotient: the answer after we divide one number by another e.g. dividend ÷ divisor = quotient.

Reciprocal: a pair of numbers that multiply together to give 1.

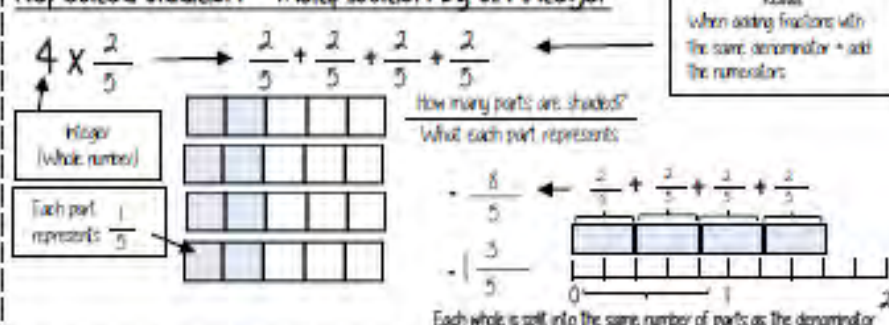


Representing a fraction

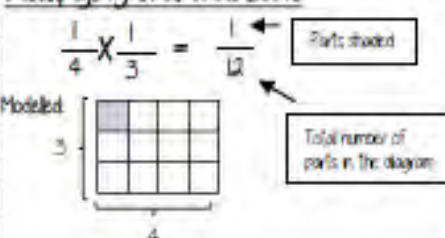


ALL PARTS of a fraction are of equal size

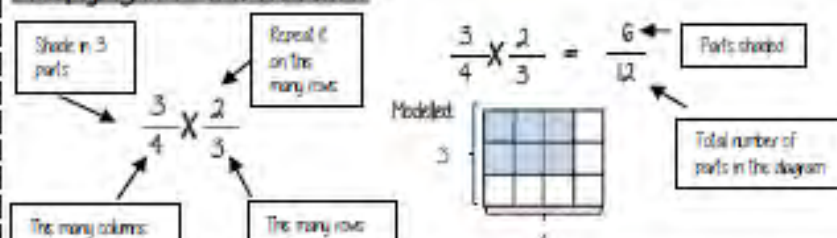
Repeated addition = multiplication by an integer



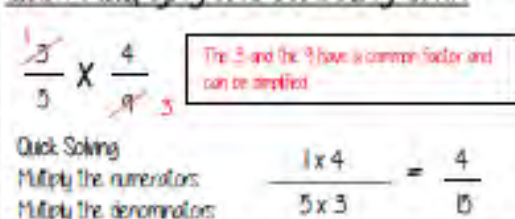
Multiplying unit fractions



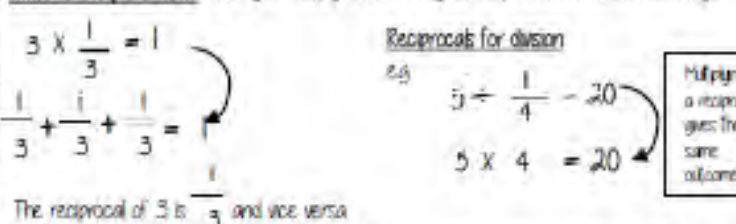
Multiplying non-unit fractions



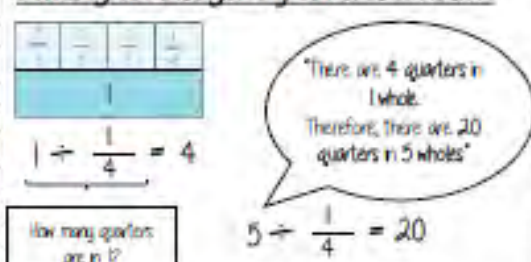
Quick Multiplying and Cancelling down



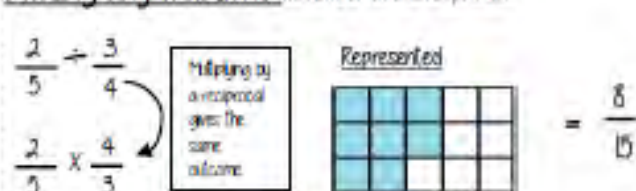
The reciprocal



Dividing an integer by a unit fraction



Dividing any fractions



YEAR 8 - REPRESENTATIONS...

Working in the Cartesian plane

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Label and identify lines parallel to the axes
- Recognise and use basic straight lines
- Identify positive and negative gradients
- Link linear graphs to sequences
- Plot $y = mx + c$ graphs

Keywords

Quadrant: four quarters of the coordinate plane

Coordinate: a set of values that show an exact position

Horizontal: a straight line from left to right (parallel to the x axis)

Vertical: a straight line from top to bottom (parallel to the y axis)

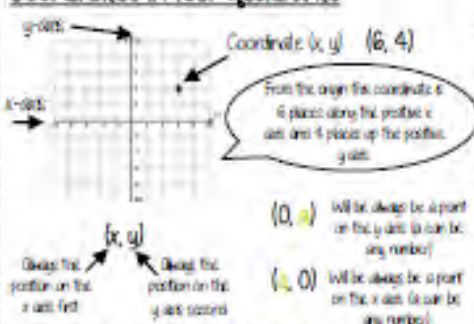
Origin: (0,0) on a graph The point the two axes cross

Parallel: Lines that never meet

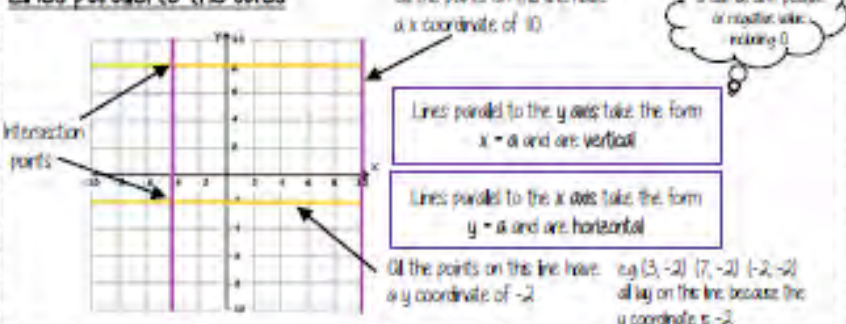
Gradient: The steepness of a line

Intercept: Where lines cross

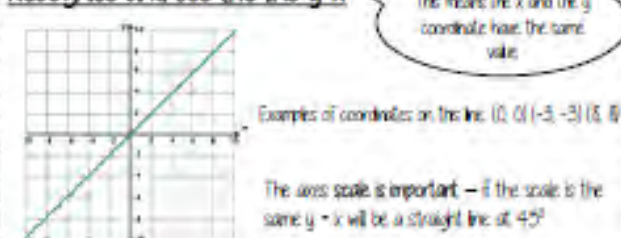
Coordinates in four quadrants



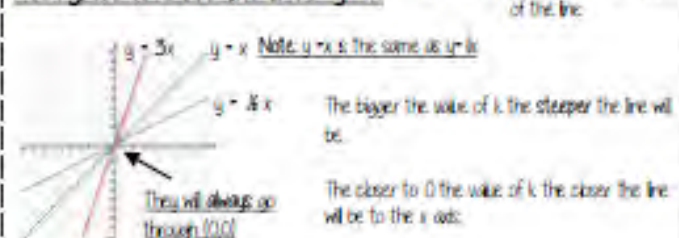
Lines parallel to the axes



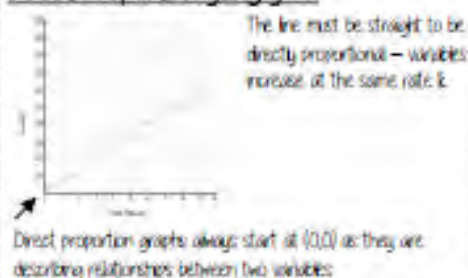
Recognise and use the line $y=x$



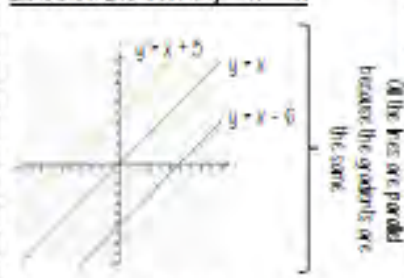
Recognise and use the lines $y=kx$



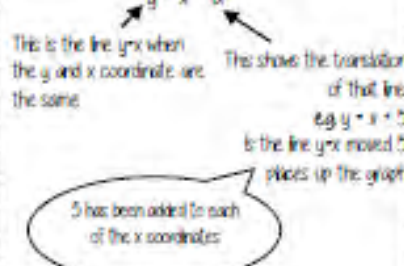
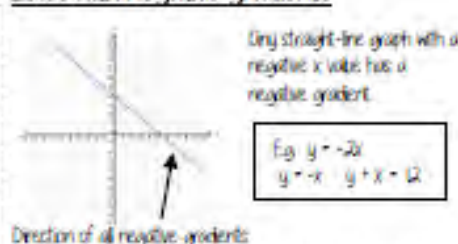
Direct Proportion using $y=kx$



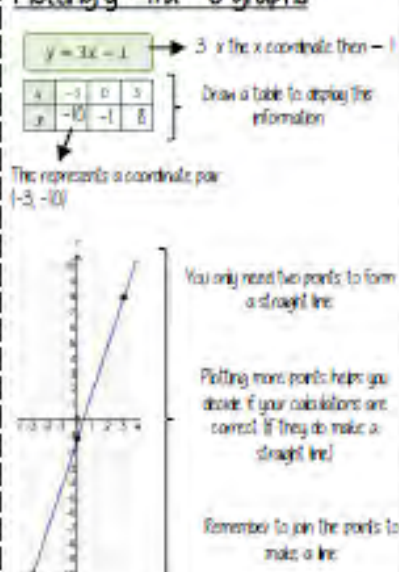
Lines in the form $y = x + a$



Lines with negative gradients



Plotting $y = mx + c$ graphs



YEAR 8 - REPRESENTATIONS...

Representing Data

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Draw and interpret scatter graphs
- Describe correlation and relationships
- Identify different types of non-linear relationships
- Design and complete an ungrouped frequency table
- Read and interpret grouped tables (discrete and continuous data)
- Represent data in two way tables

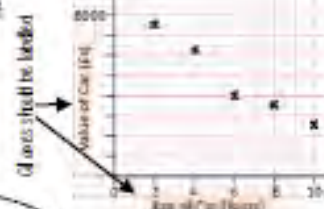
Keywords

Variable: a quantity that may change within the context of the problem
Relationship: the link between two variables (Items) Eg Between sunny days and ice cream sales
Correlation: the mathematical definition for the type of relationship
Origin: where two axes meet on a graph
Line of best fit: a straight line on a graph that represents the data on a scatter graph
Outlier: a point that lies outside the trend of graph
Quantitative: numerical data
Qualitative: descriptive information, colours, genders, names, emotions etc
Continuous: quantitative data that has an infinite number of possible values within its range
Discrete: quantitative or qualitative data that only takes certain values
Frequency: the number of times a particular data value occurs

Draw and interpret a scatter graph

Age of Car (Years)	2	4	5	8	10
Value of Car (£k)	7500	6250	4000	3500	2500

- The data may not be given in size order
- The data forms information pairs for the scatter graph
- Not all data has a relationship



"This scatter graph shows as the age of a car increases the value decreases"

The link between the data can be explained verbally

The axis should fit all the values on and be equally spread out

Linear Correlation



As one variable increases so does the other variable

As one variable increases the other variable decreases

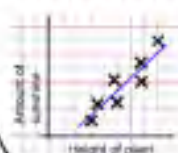
There is no relationship between the two variables

The line of best fit

The Line of best fit is used to make estimates about the information in your scatter graph

Things to know

- The line of best fit **DOES NOT** need to go through the origin (The point the axes cross)
- There should be approximately the same number of points above and below the line (It may not go through any points)
- The line extends across the whole graph



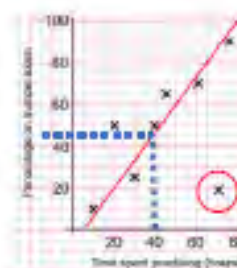
It is only an estimate because the line is designed to be an average representation of the data

It is always a straight line

Using a line of best fit

Interpolation is using the line of best fit to estimate values inside our data point

eg 40 hours resting predicts a percentage of 45



Extrapolation is where we use our line of best fit to predict information outside of our data

This is not always useful - in the example you cannot score more than 100% So resting for longer can not be estimated

This point is an 'outlier' It is an outlier because it doesn't fit the model and stands apart from the data

Ungrouped Data

The number of times an event happened

The table shows the number of siblings students have. The answers were:
3, 1, 2, 0, 3, 4, 1, 1, 2, 0, 2

2 people had 0 siblings. This means there are 0 siblings to be counted here

Number of siblings	Frequency
0	2
1	3
2	4
3	2
4	1

2 + 2 + 2 + 2 OR 2 x 4 = 8
3 x 3 OR 3 x 2 = 6

Best represented by discrete data (Not always a number)

2 people have 3 siblings so there are 6 siblings in total

OVERALL there are 0 + 3 + 8 + 6 + 4 Siblings = 21 siblings

Grouped Data

If we have a large spread of data it is better to group it. This is so it is easier to look for a trend. Form groups of equal size to make comparison more valid and spread the groups out from the smallest to the largest value

Discrete Data
The gaps are not empty

Group of TV (hrs)	Day	Frequency
0-10	Thu, Fri	7
11-20	Thu, Thu, Fri	8
21-30	Thu	5
31-40	Fri	3

We do not know the exact value of each item in a group - so an estimate would be based to calculate the overall total (Midpoint)

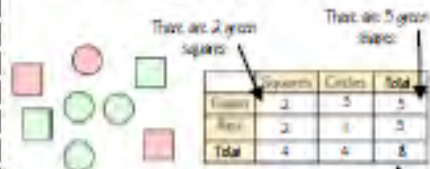
Continuous Data
To create the values are infinite requires representation of the data

Weight (kg)	Frequency
50 <= A < 60	1
60 <= A < 70	3
70 <= A < 80	5

eg the group makes every weight bigger than 60kg up to and including 70kg

Representing data in two-way tables

Two-way tables represent discrete information in a visual way that allows you to make conclusions, find probability or find totals of sub-groups



Using your two-way table

To find a fraction
eg What fraction of the items are red? 3 red items
but 8 items in total = $\frac{3}{8}$

Interlocking Use your fraction, decimal percentage, equivalent knowledge

YEAR 8 - REPRESENTATIONS...

Tables and Probability

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Construct a sample space diagram
- Systematically list outcomes
- Find the probability from two-way tables
- Find the probability from Venn diagrams

Keywords

Outcomes: the result of an event that depends on probability

Probability: the chance that something will happen

Set: a collection of objects

Chance: the likelihood of a particular outcome

Event: the outcome of a probability - a set of possible outcomes

Biased: a built in error that makes all values wrong by a certain amount

Union: Notation 'U' meaning the set made by comparing the elements of two sets

Construct sample space diagrams



Sample space diagrams provide a systematic way to display outcomes from events

The possible outcomes from tossing a coin

The possible outcomes from rolling a dice

	1	2	3	4	5	6
H	1H	2H	3H	4H	5H	6H
T	1T	2T	3T	4T	5T	6T

This is the set notation to list the outcomes S =

$$S = \{1H, 2H, 3H, 4H, 5H, 6H, 1T, 2T, 3T, 4T, 5T, 6T\}$$

In between the { } are the possible outcomes

Probability from sample space

The possible outcomes from rolling a dice

	1	2	3	4	5	6
H	1H	2H	3H	4H	5H	6H
T	1T	2T	3T	4T	5T	6T

This is the set notation that represents the question P

What is the probability that an outcome has an even number and a tail?

$$P(\text{Even number and Tails}) = \frac{3}{12}$$

In between the () is the event asked for

There are three even numbers with tails

Numerator: the event

Denominator: the total number of outcomes

There are twelve possible outcomes

Probability from two-way tables

	Car	Bus	Walk	Total
Boys	15	24	14	53
Girls	6	20	21	47
Total	21	44	35	100

$$P(\text{Girl walk to school}) = \frac{21}{100}$$

The total number of items

The event

The total in the set

Product Rule

The number of items in event a

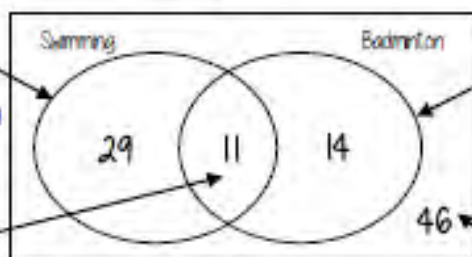
x

The number of items in event b

Probability from Venn diagrams

This whole circle includes everyone that went swimming. Because 11 did both we calculate just swimming by $40 - 11$

The intersection represents both Swimming AND badminton



This whole circle includes everyone that went to badminton. Because 11 did both we calculate just badminton by $25 - 11$

The number outside represents those that did neither badminton or swimming

$$P(\text{Just swimming}) = \frac{29}{100}$$

$$100 - 29 - 11 = 60$$

100 students were questioned if they played badminton or went to swimming club. 40 went swimming, 25 went to badminton and 11 went to both.

YEAR 8 - ALGEBRAIC TECHNIQUES...

Brackets, Equations & Inequalities

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Form Expressions
- Expand and factorise single brackets
- Form and solve equations
- Solve equations with brackets
- Represent inequalities
- Form and solve inequalities

Keywords

Simplify: grouping and combining similar terms
Substitute: replace a variable with a numerical value
Equivalent: something of equal value
Coefficient: a number used to multiply a variable
Product: multiply terms
Highest Common Factor (HCF): the biggest factor (or number that multiplies to give a term)
Inequality: an inequality compares two values showing if one is greater than, less than or equal to another

Form expressions

For unknown variables, a letter is normally used in its place

More than - ADD

Less than/ difference - SUBTRACT

eg 4 more than $t \rightarrow t + 4$
 8 less than $k \rightarrow k - 8$

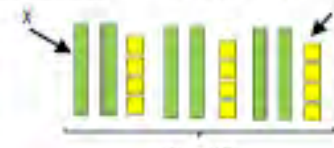
Only similar terms can be grouped together

eg Find the perimeter of this shape.
 (Perimeter = length around outside of shape)
 t 
 $2t + 1 + t + 2t + 1 + t + 2t + 1 \rightarrow 6t + 2$

Directed numbers

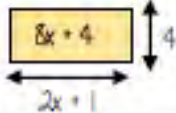
$++ \rightarrow +$
 $-- \rightarrow +$
 $+- \rightarrow -$
 $-+ \rightarrow -$
 eg $a = -5$ and $b = 2$
 $a^2 = a \times a = -5 \times -5 = 25$
 $b \times a = 2 \times -5 = -10$

Multiply single brackets

$3(2x + 4)$

 $6x + 12$

 Different representations of $3(2x + 4) = 6x + 12$

Factorise into a single bracket

$8x + 4$

 Try and make this the highest common factor
 The two values multiply together (also the area of the rectangle)
 $8x + 4 = 4(2x + 1)$
 Note:
 $8x + 4 = 2(4x + 2)$
 This is factorised but the HCF has not been used

Solve equations with brackets

$3(2x + 4) = 30$

 $6x + 12 = 30$
 -12
 $6x = 18$
 -6
 $x = 3$
 Expand the brackets
 Substitute to check your answer
 This could be negative or a fraction or decimal

Simple Inequalities

$<$ less than
 $\leq$ Less than or equal to
 $>$ More than
 $\geq$ More than or equal to
 eg $x < 10$
 Say this out loud
 "x is a value less than 10"
 Note:
 $x < 10$ and $10 > x$
 represent the same values
 eg $x > 2$
 Say this out loud
 "x is more than the value 2"
 Note:
 $x > 2$ and $2 < x$
 represent the same values
 eg $x \leq 20$
 "my value $\times 2$ is less than or equal to 20"
 $x \leq 10$
 The biggest the value can be is 10

Form and solve inequalities

Two more than treble my number is greater than 11
 Find the possible range of values:
 Form $x \rightarrow x \times 3 \rightarrow +2 \rightarrow 11$
 $3x + 2 > 11$
 Solve $x \leftarrow -2 \leftarrow -3 \leftarrow -2 \leftarrow 11$
 $x > 3$
 Check
 This would suggest any value bigger than 3 satisfies the statement
 $3 \times 3 + 2 = 11 \checkmark$ $10 \times 3 + 2 = 32 \checkmark$

Algebraic constructs

Expression
 A sentence with a minimum of two numbers and one maths operation
Equation
 A statement that two things are equal
Term
 A single number or variable
Identity
 An equation where both sides have variables that cause the same answer includes $\equiv$
Formula
 A rule written with all mathematical symbols
 eg area of a rectangle $A = b \times h$

YEAR 8 - ALGEBRAIC TECHNIQUES...

Sequences

@whisto_maths

What do I need to be able to do?

- By the end of this unit you should be able to:
- Generate a sequence from term to term or position to term rules
 - Recognise arithmetic sequences and find the n th term
 - Recognise geometric sequences and other sequences that arise

Keywords

- Sequence: items or numbers put in a pre-decided order
 Term: a single number or variable
 Position: the place something is located
 Linear: the difference between terms increases or decreases (+ or -) by a constant value each time
 Non-linear: the difference between terms increases or decreases in different amounts; or by $\times$ or $\div$
 Difference: the gap between two terms
 Arithmetic: a sequence where the difference between the terms is constant
 Geometric: a sequence where each term is found by multiplying the previous one by a fixed non zero number

Linear and Non Linear Sequences

Linear Sequences - increase by addition or subtraction and the same amount each time

Non-linear Sequences - do not increase by a constant amount - quadratic, geometric and Fibonacci

- Do not plot as straight lines when modelled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

Fibonacci Sequence - look out for this type of sequence

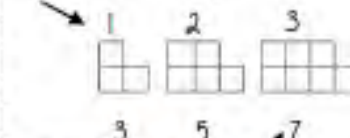
0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms



Sequence in a table and graphically

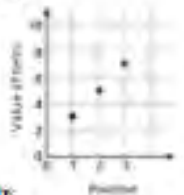
Position the place in the sequence



"The term in position 3 has 7 squares"

Term the number or variable (the number of squares in each image)

Graphically



In a table

Position	1	2	3
Term	3	5	7

-2 -2

Because the terms increase by the same addition each time, this is linear - as seen in the graph

Sequences from algebraic rules

This is substitution

$$3n + 7$$

This will be linear - note the single power of n . The values increase at a constant rate

$$2n - 5$$

Substitute the number of the term you are looking for in place of ' n '

eg
 1^{st} term $= 2(1) - 5 = -3$
 2^{nd} term $= 2(2) - 5 = -1$
 100^{th} term $= 2(100) - 5 = 195$

$$3n^2 + 7$$

This is not linear as there is a power for n

Checking for a term in a sequence

Form an equation

Is 201 in the sequence $3n - 4$?

$$3n - 4 = 201$$

Algebraic rule

Solving this will find the position of the term in the sequence. ONLY an integer solution can be in the sequence

Term to check

Complex algebraic rules

Misconceptions and comparisons

$$2n^2$$

2 times whatever n squared is

eg
 1^{st} term $= 2 \times 1^2 = 2$
 2^{nd} term $= 2 \times 2^2 = 8$
 100^{th} term $= 2 \times 100^2 = 20000$

$$(2n)^2$$

2 times n then square the answer

eg
 1^{st} term $= (2 \times 1)^2 = 4$
 2^{nd} term $= (2 \times 2)^2 = 16$
 100^{th} term $= (2 \times 100)^2 = 40000$

$$n(n + 5)$$

eg
 1^{st} term $= 1(1 + 5) = 6$
 2^{nd} term $= 2(2 + 5) = 14$
 100^{th} term $= 100(100 + 5) = 10500$

You don't need to expand the expression

Finding the algebraic rule

This is the 4 times table $\rightarrow 4, 8, 12, 16, 20, \dots$

$$4n$$

$\downarrow \downarrow \downarrow$
 7, 11, 15, 19, 22

This has the same constant difference - but is 3 more than the original sequence

$$4n + 3$$

This is the constant difference between the terms in the sequence

This is the comparison (difference) between the original and new sequence

YEAR 8 - ALGEBRAIC TECHNIQUES...

Indices

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Add/ Subtract expressions with indices
- Multiply expressions with indices
- Divide expressions with indices
- Know the addition law for indices
- Know the subtraction law for indices

Keywords

Base: The number that gets multiplied by a power

Power: The exponent — or the number that tells you how many times to use the number in multiplication

Exponent: The power — or the number that tells you how many times to use the number in multiplication

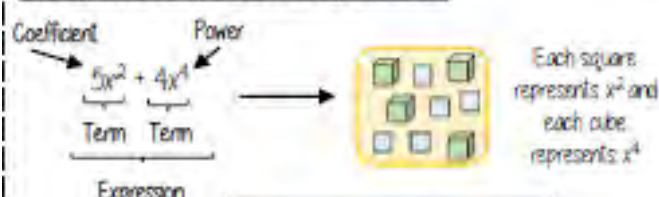
Indices: The power or the exponent

Coefficient: The number used to multiply a variable

Simplify: To reduce a power to its lowest term

Product: Multiply

Addition/ Subtraction with indices



Only similar terms can be simplified. If they have different powers, they are unlike terms.

$$5x^2 + 2x^2 \rightarrow 7x^2$$

$$5x^2 + 6x^4 - 3x^2 + x^4 \rightarrow 2x^2 + 7x^4$$

Multiply expressions with indices

$$\begin{aligned} 4b \times 3a &= 4 \times b \times 3 \times a \\ &= 4 \times 3 \times b \times a \\ &= 12ab \end{aligned}$$

$$\begin{aligned} 5t \times 9t &= 5 \times t \times 9 \times t \\ &= 5 \times 9 \times t \times t \\ &= 45t^2 \end{aligned}$$

$$\begin{aligned} 2b^4 \times 3b^2 &= 2 \times b \times b \times b \times b \times 3 \times b \times b \\ &= 2 \times 3 \times b \times b \times b \times b \times b \times b \\ &= 6b^6 \end{aligned}$$

There are often misconceptions with this calculation but break down the powers.

Addition/ Subtraction laws for indices

$$3^5 \times 3^2 = (3 \times 3 \times 3 \times 3 \times 3) \times (3 \times 3) \rightarrow 3^7$$

The base number is all the same so the terms can be simplified

Addition law for indices

$$a^m \times a^n = a^{m+n}$$

$$3^5 \div 3^2 \rightarrow 3^3$$

$$\frac{3 \times 3 \times 3 \times 3 \times 3}{3 \times 3} \rightarrow \frac{3^3}{3^0} \rightarrow \frac{3^3}{1}$$

Subtraction law for indices

$$a^m \div a^n = a^{m-n}$$

Divide expressions with indices

$$\frac{24}{36} \rightarrow \frac{\cancel{2} \times \cancel{2} \times 2 \times \cancel{3}}{\cancel{2} \times \cancel{3} \times 2 \times \cancel{3}} \rightarrow \frac{2}{3}$$

$$\frac{5a^3b^2}{15ab^6} \rightarrow \frac{\cancel{5} \times \cancel{a} \times \cancel{a} \times \cancel{a} \times \cancel{b} \times \cancel{b}}{3 \times \cancel{5} \times \cancel{a} \times \cancel{b} \times \cancel{b} \times \cancel{b} \times \cancel{b} \times \cancel{b}} \rightarrow \frac{a^2}{3b^4}$$

Cross cancelling factors shows cancels the expression

$$\frac{23a^7y^2}{5db^6}$$

This expression cannot be divided (cancelled down) because there are no common factors or similar terms

YEAR 8 - DEVELOPING NUMBER...

Fractions & Percentages

@whisto_maths

What do I need to be able to do?

By the end of this unit, you should be able to:

- Convert between FDP less than and more than 100
- Increase or decrease using multipliers
- Express an amount as a percentage
- Find percentage change

Keywords

Percent: parts per 100 – written using the % symbol

Decimal: a number in our base 10 number system. Numbers to the right of the decimal place are called decimals.

Fraction: a fraction represents how many parts of a whole value you have.

Equivalent: of equal value.

Reduce: to make smaller in value.

Growth: to increase/ to grow.

Integer: whole number, can be positive, negative or zero.

Invest: use money with the goal of it increasing in value over time (usually in a bank).

Convert FDP

R

70/100 → This also means 70 = 100 → 70 out of 100 squares: 70 "hundredths" = 7 "tenths" = 0.7

Using a calculator: $\frac{70}{100} = 0.7$

Be careful of recurring decimal: eg $\frac{1}{3} = 0.3333333$
The dot above the 3

Convert to a decimal: $\frac{70}{100} = 0.7$
× 100 converts to a percentage

Fraction/ Percentage of amount

R

Find $\frac{3}{5}$ of £60

Remember: $\frac{3}{5} = 60\%$
 10% of £60 = £6
 50% of £60 = £30
 60% of £60 = £36

Remember: $\frac{3}{5} = 60\%$
 60% of £60 = £36
 $0.6 \times 60 = £36$

Convert FDP < and > 100%

100 hundredths: 10 tenths: 100%
140 hundredths: 14 tenths: 140%
40 hundredths: 4 tenths: 40%

$100\% + 40\% = 1 + 0.40 = 1.40$

Percentage decrease: Multipliers

100% → Decrease by 58% → 42%

$100\% - 58\% = 42\%$
 $100 - 58 = 42$

Multiplier: Less than 1

Percentage increase: Multipliers

100% → Increase by 12% → 112%

$100\% + 12\% = 112\%$
 $100 + 12 = 112$

Multiplier: More than 1

Express as a % - Non-calculator

7 per every 10 are orange: $\frac{7}{10}$ → This means that 70 per every 100 are orange: $\frac{70}{100}$ → 70%

27 per every 50 shaded: $\frac{27}{50}$ → 54 per every 100 shaded: $\frac{54}{100}$ → 54%

Denominator 100
Equivalent fractions

Express as a % - Calculator

$\frac{13}{30} \times 100 = 43.3333...%$
43%

Can't use equivalent: easy to find per hundred

This the same as $(13 \div 30)$

Decimal percentages are still a percentage

Percentage change

I bought a phone for £200
A year later sold it for £125

100% → £200
£125

All values of change compare to the ORIGINAL value

Percentage loss: $\frac{75}{200} \times 100 = 37.5\%$

Difference in value: $\frac{75}{200} \times 100$

I bought a house for £180,000, I later sold it for £216,000

100% → £180,000

Percentage profit: $\frac{36,000}{180,000} \times 100 = 20\%$

Money made (profit value)

Choose appropriate method

The language and wording of the question is the key

Have you represented the question in a bar model?
Can you use a calculator?

YEAR 8 - DEVELOPING NUMBER...

Standard Form

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Write numbers in standard form and as ordinary numbers
- Order numbers in standard form
- Add/Subtract with standard form
- Multiply/Divide with standard form
- Use a calculator with standard form

Keywords

Standard (index) Form: A system of writing very big or very small numbers

Commutative: an operation is commutative if changing the order does not change the result

Base: The number that gets multiplied by a power

Power: The exponent – or the number that tells you how many times to use the number in multiplication

Exponent: The power – or the number that tells you how many times to use the number in multiplication

Indices: The power or the exponent

Negative: A value below zero

Positive powers of 10

1 billion = 1 000 000 000

$$10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 = 10^9$$

Addition rule for indices: $10^a \times 10^b = 10^{a+b}$

Subtraction rule for indices: $10^a \div 10^b = 10^{a-b}$

Standard form with numbers > 1

Any number between 1 and less than 10 $\rightarrow A \times 10^n$ $\leftarrow$ Any integer

Example

$$\begin{aligned} 3.2 \times 10^4 \\ = 3.2 \times 10 \times 10 \times 10 \times 10 \\ = 32000 \end{aligned}$$

Non-example

$$\begin{aligned} (0.8) \times 10^4 \\ 5.3 \times 10^{0.5} \end{aligned}$$

Negative powers of 10

0.001	$\frac{1}{10}$	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
$1 \times \frac{1}{1000}$	10^{-1}	10^0	10^{-1}	10^{-2}	10^{-3}
1×10^{-3}	0	0	0	0	0

Only value for the power 0 always = 1

Negative powers do not indicate negative solutions

Numbers between 0 and 1

0.054	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
$= 5.4 \times 10^{-2}$	10^0	10^{-1}	10^{-2}	10^{-3}
	0	0	5	4

A negative power does not mean a negative answer – it means a number closer to 0

Order numbers in standard form

6.4×10^{-2}	2.4×10^2	3.3×10^0	1.3×10^{-1}
0.064	240	1	0.13

Look at the power first will the number be $>$, $=$ or $<$ than 1

Use a place value grid to compare the numbers for ordering

Mental calculations

$$6.4 \times 10^2 \times 1000 \text{ Not in Standard Form}$$

$$= 6.4 \times 10^2 \times 10^3 \text{ Use addition for indices rule}$$

$$= 6.4 \times 10^5$$

$$(2 \times 10^3) \div 4 \text{ Divide the values}$$

$$= (2 \div 4) \times 10^3$$

$$= 0.5 \times 10^3$$

$$3 \times 10^5 \times 2$$

$$= 2.4 \times 10^5 \text{ Not in Standard Form}$$

$$= 2.4 \times 10^1 \times 10^5 \text{ Use addition for indices rule}$$

$$= 2.4 \times 10^6$$

Remember the layout for standard form

Any number between 1 and less than 10 $\rightarrow A \times 10^n$ $\leftarrow$ Any integer

Addition and Subtraction

Tip: Convert into ordinary numbers first and back to standard form at the end

Method 1

$$\begin{aligned} &= 600000 + 800000 \\ &= 1400000 \\ &= 1.4 \times 10^6 \end{aligned}$$

More robust method
Less room for misinterpretation
Easier to do calculations with negative indices
Can use for different powers

$$6 \times 10^5 + 8 \times 10^5$$

Method 2

$$\begin{aligned} &= (6 + 8) \times 10^5 \\ &= 14 \times 10^5 \\ &= 1.4 \times 10^1 \times 10^5 \\ &= 1.4 \times 10^6 \end{aligned}$$

This is not the final answer

Only works if the powers are the same

Multiplication and division

$$\frac{1.5 \times 10^5}{0.3 \times 10^3} \text{ Division questions can look like this}$$

$$\left(\frac{1.5}{0.3} \right) \times \left(\frac{10^5}{10^3} \right)$$

$$(15 \div 0.3) \times 10^{5-3}$$

$$= 5 \times 10^2$$

For multiplication and division you can look at the values for A and the powers of 10 as two separate calculations

Round addition and subtraction later for indices – they are needed for the calculations

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

Using a calculator

$$14 \times 10^5 \times 3.9 \times 10^3$$

Use a calculator to work out the question to a suitable degree of accuracy

Input 14 and press $\times 10^5$ Then press 3 (for the power)

Press $\times$

Input 3.9 and press $\times 10^3$ Then press 3 (for the power)

Press $=$

This gives you the solution



Click calculator for video tutorial

To put into standard form and a suitable degree of accuracy

Press MODE SETUP and then press 7 for sci mode

Choose a degree of accuracy so in most cases press 2

$$\text{Answer } 5.5 \times 10^8$$

YEAR 8 - DEVELOPING NUMBER...

Number Sense

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Round numbers to powers of 10 and 1 sf
- Round numbers to any dp
- Estimate solutions
- Calculate using order of operations
- Calculate with money, units of measurement and time

Keywords

Significant: Place value of importance
Round: Making a number simpler but keeping its value close to what it was
Decimal: Place holders after the decimal point
Overestimate: Rounding up – gives a solution higher than the actual value
Underestimate: Rounding down – gives a solution lower than the actual value
Metric: A system of measurement
Balance: The amount of money in a bank account
Deposit: Putting money into a bank account

Round to powers of 10 and 1 sig figure

R If the number is halfway between we "round up"

5495 to the nearest 1000



5475 to the nearest 100



5475 to the nearest 10



370 to 1 significant figure is 400

37 to 1 significant figure is 40

3.7 to 1 significant figure is 4

0.37 to 1 significant figure is 0.4

0.00037 to 1 significant figure is 0.0004

Round to the first non-zero number

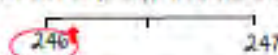
Round to decimal places

To 1dp – to one number after the decimal
 To 2dp – to two numbers after the decimal

2.46192 (to 1dp) – is this closer to 2.4 or 2.5



2.46192 (to 2dp) – is this closer to 2.46 or 2.47



Focus on the numbers after the decimal point

2.46192 The shows the number is closer to 2.5

2.46192 The shows the number is closer to 2.46

Estimate the calculation

Round to 1 significant figure to estimate

$$4.2 \times 6.7 \approx 4 \times 7 \approx 28$$

This is an overestimate because the 6.7 was rounded up more

The equal sign changes to show it is an estimation

$$214 \times 3.1 \approx 20 \times 3 \approx 60$$

This is an underestimate because both values were rounded down

It is good to check all calculations with an estimate in all aspects of maths – it helps you identify calculation errors

Order of operations

Brackets Operations in brackets are calculated first

Other operations e.g. powers, roots

Multiplication/ Division

They are carried out in the order from left to right in the question

Addition/ Subtraction

They are carried out in the order from left to right in the question

Calculations with money

Debit – You have £0 or more in an account

Credit – You have less than £0 in an account

Money calculations are to 2dp



Using a calculator – ensure you are working in the correct units

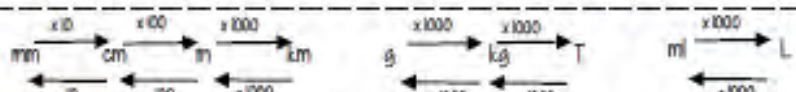
$$£1.50 + 50p = 1.50 + 0.50 \text{ (in pence)}$$

$$= 1.50 + 0.50 \text{ (in pounds)}$$

$$£1 = 100p$$



Units are important: Useful Conversions



Metric measures of length

$$\text{km} = 1000 \times \text{meter}$$

$$\text{Centi} = \frac{1}{100} \times \text{meter}$$

$$\text{Milli} = \frac{1}{1000} \times \text{meter}$$

Time and the calendar



1 Year – the amount of time it takes Earth to go around the sun 365 (and a quarter) days
Leap Year – 366 days (every 4 years)



12 Months – one year = 52 weeks

31 days – Jan, March, May, July

30 days – April, June, Sept, Nov

28 days – Feb (29 leap year)

1 week – 7 days

Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

1 day – 24 hours

1 hour – 60 minutes

1 minute – 60 seconds

Use a number line for time calculations!

Units of weight/ capacity

Weight – g, kg, t

Capacity (volume of liquid) – ml, l

Analogous Clock



12-hour clock

- Use am (morning) and pm (afternoon)
- Only use hour times up to 12

Digital Clock (24-hour times)



24-hour clock

- 0-11 (morning hours)
- 12-23 (afternoon hours)

YEAR 8 - DEVELOPING GEOMETRY...

Angles in parallel lines and polygons

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Identify alternate angles
- Identify corresponding angles
- Identify co-interior angles
- Find the sum of interior angles in polygons
- Find the sum of exterior angles in polygons
- Find interior angles in regular polygons

Keywords

Parallel: Straight lines that never meet

Angle: The figure formed by two straight lines meeting (measured in degrees)

Transversal: A line that cuts across two or more other (normally parallel) lines

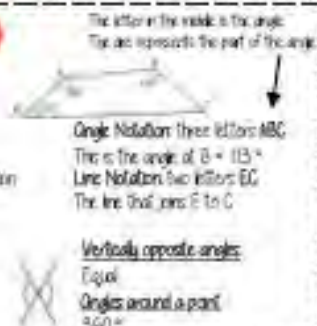
Isosceles: Two equal size sides and equal size angles (in a triangle or trapezium)

Polygon: A 2D shape made with straight lines

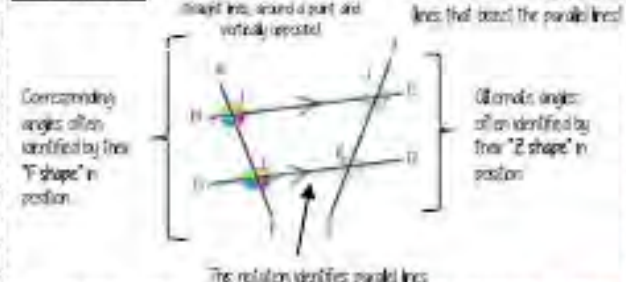
Sum: Addition (total of all the interior angles added together)

Regular polygon: All the sides have equal length, all the interior angles have equal size

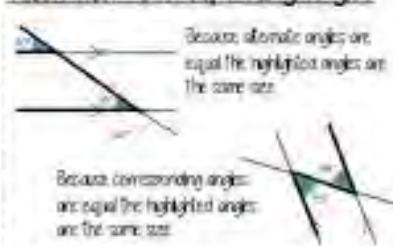
Basic angle rules and notation



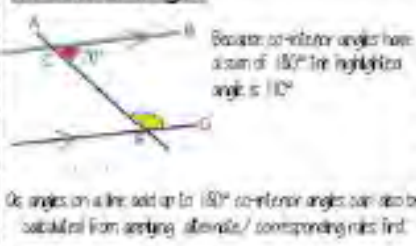
Parallel lines



Alternate/Corresponding angles



Co-interior angles



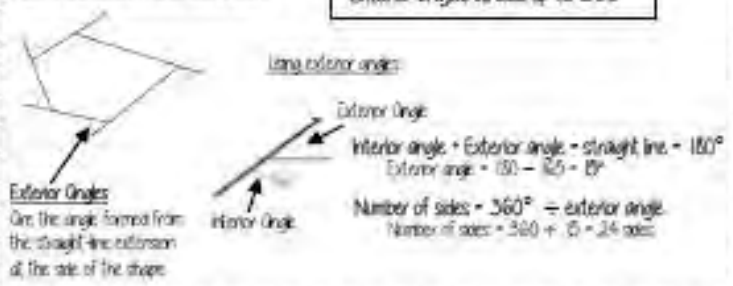
Triangles & Quadrilaterals



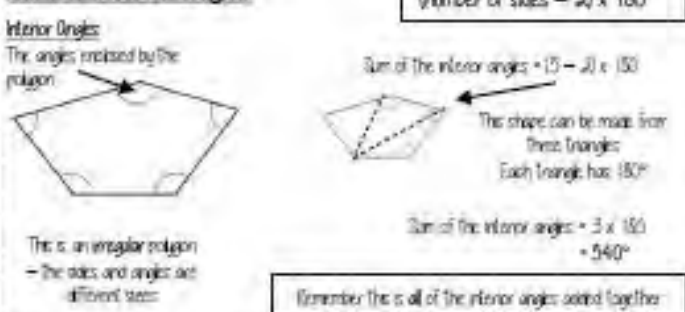
Properties of Quadrilaterals



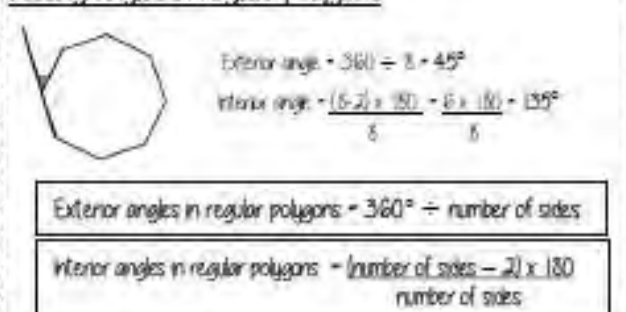
Sum of exterior angles



Sum of interior angles



Missing angles in regular polygons



YEAR 8 - DEVELOPING GEOMETRY...

Area of trapezia and Circles

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Recall area of basic 2D shapes
- Find the area of a trapezium
- Find the area of a circle
- Find the area of compound shapes
- Find the perimeter of compound shapes

Keywords

Congruent: The same

Area: Space inside a 2D object

Perimeter: Length around the outside of a 2D object

π (π): The ratio of a circle's circumference to its diameter

Perpendicular: At an angle of 90° to a given surface

Formula: A mathematical relationship/ rule given in symbols. Eg. $b \times h$ = area of rectangle/ square

Infinity (∞): A number without a given ending (too great to count to the end of the number) — never ends

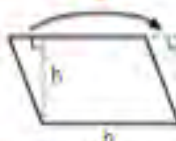
Sector: A part of the circle enclosed by two radii and an arc

Area — rectangles, triangles, parallelograms

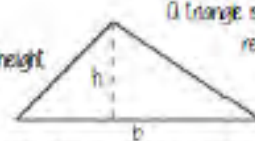
Rectangle:
Base $\times$ Height



Parallelogram/ Rhombus:
Base $\times$ Perpendicular height



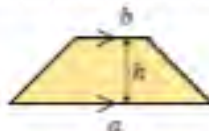
Triangle:
 $\frac{1}{2} \times$ Base $\times$ Perpendicular height



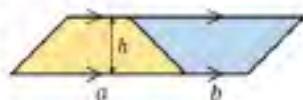
A triangle is half the size of the rectangle it would fit in

Area of a trapezium

$$\text{Area of a trapezium} = \frac{(a+b) \times h}{2}$$



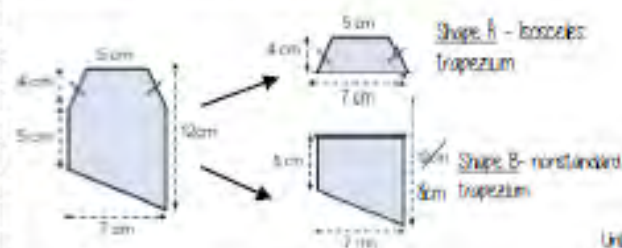
Why?



- Two congruent trapeziums make a parallelogram
- New length $(a+b) \times$ height
- Divide by 2 to find area of one

Compound shapes

To find the area compound shapes often need splitting into more manageable shapes first. Identify the shapes and missing sides etc. first.



$$\text{Shape A} + \text{Shape B} = \text{total area}$$

$$\frac{(5+7) \times 4}{2} + \frac{(7+8) \times 5}{2} = 24 + 45.5 = 69.5 \text{ cm}^2$$

Area of a circle (Non-Calculator)

Read the question — leave in terms of π or if $\pi \approx 3.14$ (provides an estimate for answers)

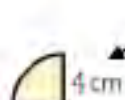
Area of a circle:
 $\pi \times \text{radius}^2$



Diameter = 8 cm
 $\therefore$ Radius = 4 cm

$$\begin{aligned} \pi \times \text{radius}^2 \\ &= \pi \times 4^2 \\ &= \pi \times 16 \\ &= 16\pi \text{ cm}^2 \end{aligned}$$

Find the area of one quarter of the circle



$$\begin{aligned} \text{Circle Area} &= 16\pi \text{ cm}^2 \\ \text{Quarter} &= 4\pi \text{ cm}^2 \end{aligned}$$

Area of a circle (Calculator)



SHIFT $\times 10^2$

How to get π symbol on the calculator

Area of a circle:
 $\pi \times \text{radius}^2$



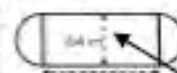
It is important to round your answer suitably — to significant figures or decimal places. This will give you a decimal solution that will go on forever!

Compound shapes including circles

Circumference:
 $\pi \times \text{diameter}$

Compound shapes are not always area questions. For Perimeter you will need to use the circumference.

Spotting diameters and radii



This dimension is also the diameter of the semi circles

$$\begin{aligned} \text{Arc lengths} &= \pi \times 64 \\ &= 64\pi \end{aligned}$$

Don't need to have this because there are 2 ends which make the whole circle

Arc lengths + Straight lengths = total perimeter

$$\begin{aligned} &= 64\pi + 100 + 100 \\ &= (300 + 64\pi) \text{ m} \\ \text{OR } &= 501.1 \text{ m} \end{aligned}$$

Still remember to split up the compound shape into smaller more manageable individual shapes first

YEAR 8 - REASONING WITH DATA...

The data handling cycle

@whisto_maths

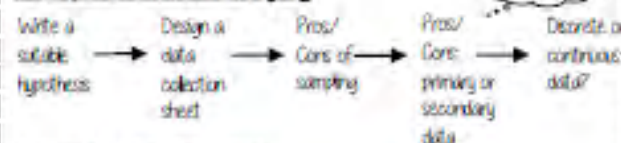
What do I need to be able to do?

- By the end of this unit you should be able to
- Set up a statistical enquiry
 - Design and criticise questionnaires
 - Draw and interpret multiple bar charts
 - Draw and interpret line graphs
 - Represent and interpret grouped quantitative data
 - Find and interpret the range
 - Compare distributions

Keywords

- Hypothesis:** an idea or question you want to test
Sampling: the group of things you want to use to check your hypothesis
Primary Data: data you collect yourself
Secondary Data: data you source from elsewhere eg the internet/ newspapers/ local statistics
Discrete Data: numerical data that can only take set values
Continuous Data: numerical data that has an infinite number of values (often seen with height, distance, time)
Spread: the distance/ how spread out/ variation of data
Average: a measure of central tendency – or the typical value of all the data together
Proportion: numerical relationship that compares two things

Set up a statistical enquiry



Features of a data collection sheet

Grouped or ungrouped categories	Data Title	Tally	Frequency

Total number of that group observed

Design and criticise a questionnaire

The Question – be clear with the question – don't be too leading/ judgemental

eg How much pocket money do you get a week?

Responses – do you want closed or open responses? – do any options overlap? – Have you an option for all responses?

Zero option: ☐ £0 ☐ £0.01 - £2 ☐ £2.01 - £4 ☐ more than £4

NOTE: For responses about continuous data include inequalities $< x \leq$

Pictograms, bar and line charts

Pictogram



- Need to remember a key
- Visually able to identify more

Bar Chart



- Gaps between the bars
- Clearly labelled axes
- Scale for the axes
- Title for the bar chart
- Discrete Data

Line Chart

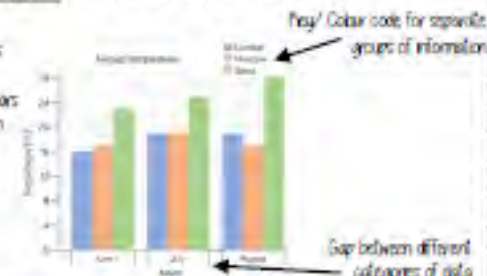


- Gaps between the lines
- Clearly labelled axes
- Scale for the axes
- Discrete Data

Multiple Bar chart

Compares multiple groups of data

- Clearly labelled axes
- Scale for axes
- Comparable data bars drawn next to each other



Draw and interpret Pie Charts

Remember a circle has 360°

Category	Frequency	Percentage
A	32	32/60
B	20	20/60
C	8	8/60

"32 out of 60 people had a dog"

This fraction of the 360 degrees represents dogs

$$\frac{32}{60} \times 360 = 192^\circ$$



Use a protractor to draw This is 192°

There were 60 people asked in this survey (Total Frequency)

Multiple method
 Or: 60 goes into 360 – 6 times
 Each frequency can be multiplied by 6 to find the degrees (proportion of 360)

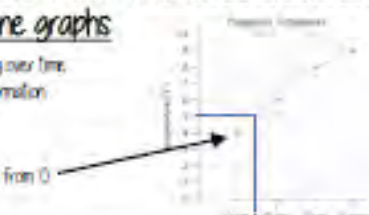
Represents quantitative, discrete data

Draw and interpret line graphs

- Commonly used to show changing over time
- The points are the recorded information and the lines join the points

Line graphs do not need to start from 0

More than one piece of data can be plotted on the same graph to compare data



It is possible to make estimates from the line eg temperature at 13.00m is 5°C

Grouped quantitative data

Time Interval	Frequency
0-10	4
10-20	6
20-30	8
30-40	10
40-50	12
50-60	14

"More than or equal to 25 and less than 50 minutes"



The use of inequalities shows that this will be a frequency diagram

This is a frequency diagram There are no gaps between the bars

Grouping the data is useful if there is a large spread of data to begin with

Find and interpret the range

The range is a measure of spread

A smaller range means there is less variation in the results – it is more consistent data

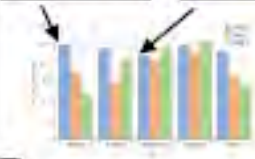
A range of 0 means all the data is the same value

Shop 1 has the smallest range – this indicates it has a more consistent flow of customers each week

Difference between the biggest and smallest values

Step 1: Highest value

Step 2: Lowest value



Range of customers = 25 – 22 = 3 (Step 1)

YEAR 8 - REASONING WITH DATA...

Measures of location

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Understand and use mean, median and mode
- Choose the most appropriate average
- Identify outliers
- Compare distributions using averages and range

Keywords

Spread: the distance/ how spread out/ variation of data
 Average: a measure of central tendency – or the typical value of all the data together
 Total: all the data added together
 Frequency: the number of times the data values occur
 Represent: something that shows the value of another
 Outlier: a value that stands apart from the data set
 Consistent: a set of data that is similar and doesn't change very much

Mean, Median, Mode

The Mean

A measure of average, to find the central tendency... a typical value that represents the data

24, 8, 4, 11, 8

Find the sum of the data (add the values) 55

Divide the overall total by how many pieces of data you have $55 \div 5$

Mean = 11

The Median

The value in the center (in the middle) of the data

24, 8, 4, 11, 8

Put the data in order 4, 8, 8, 11, 24

Find the value in the middle 4, 8, 8, 11, 24

Median = 8

NOTE: if there is no single middle value find the mean of the two numbers left

The Mode (The modal value)

This is the number OR the item that occurs the most (it does not have to be numerical)

24, 8, 4, 11, 8

This can still be easier if the data is ordered first

4, 8, 8, 11, 24

Mode = 8

Choosing the appropriate average

The average should be a representative of the data set – so it should be compared to the set as a whole – to check if it is an appropriate average.

Here are the weekly wages of a small firm

£240 £240 £240 £240 £240
£260 £260 £300 £350 £700

Which average best represents the weekly wage?

The Mean = £307

The Median = £250

The Mode = £240

Put the data back into context

Mean/Median – too high (most of this company earn £240)

Mode is the best average that represents the wage

It is likely that the salaries above £240 are more senior staff members – their salary doesn't represent the average weekly wage of the majority of employees

Identify outliers

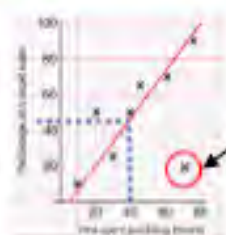
Outliers are values that stand well apart from the rest of the data

Outliers can have a big impact on range and mean
 They have less impact on the median and the mode

Sometimes it is best to not use an outlier in calculations

Height in cm
152, 150, 142, 158, 150, 151, 153, 149, 156, 160, 151, 144

Where an outlier is identified try to give it some context.
 This is likely to be a taller member of the group.
 Could the be an older student or a teacher?



Outliers can also be identified graphically e.g. on scatter graphs

Comparing distributions

Comparisons should include a statement of average and central tendency, as well as a statement about spread and consistency

Here are the number of runs scored last month by Lucy and James in cricket matches:

Lucy: 45, 32, 37, 41, 48, 35
 James: 60, 90, 41, 23, 14, 23

Lucy

Mean: 39.6 (1dp), Median: 35, Mode: no mode, Range: 16

James

Mean: 41.8 (1dp), Median: 32, Mode: 23, Range: 76

James has two extreme values that have a big impact on the range

* James is less consistent than Lucy because his scores have a greater range.
 Lucy performed better on average because her scores have a similar mean and a higher median

YEAR 8 - DEVELOPING GEOMETRY...

Line symmetry and reflection

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Recognise line symmetry
- Reflect in a horizontal line
- Reflect in a vertical line
- Reflect in a diagonal line

Keywords

Mirror line: a line that passes through the center of a shape with a mirror image on either side of the line.

Line of symmetry: same definition as the mirror line.

Reflect: mapping of one object from one position to another of equal distance from a given line.

Vertex: a point where two or more line segments meet.

Perpendicular: lines that cross at 90°

Horizontal: a straight line from left to right (parallel to the x axis)

Vertical: a straight line from top to bottom (parallel to the y axis)

Lines of symmetry

Mirror line (line of reflection)



Shapes can have more than one line of symmetry...
This regular polygon (a regular pentagon has 5 lines of symmetry)



Rhombus
Two lines of symmetry

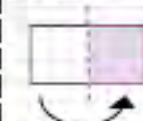
Parallelogram
No lines of symmetry



A circle has an infinite amount of lines of symmetry



Reflect horizontally/vertically (1)



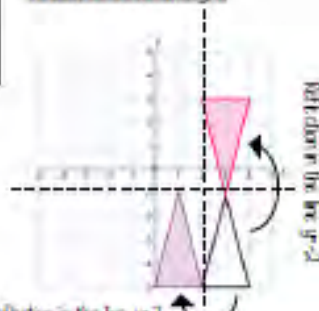
Reflection in a vertical line



Reflection in a horizontal line

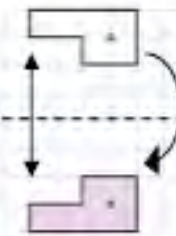
Note: a reflection doubles the area of the original shape.

Reflection on an axis grid

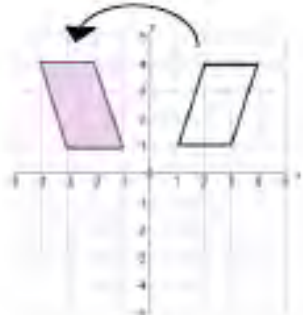


Reflect horizontally/vertically (2)

All points need to be the same distance away from the line of reflection



Reflection in the line y axis — this is also a reflection in the line $x=0$



Lines parallel to the x and y axis

REMEMBER

Lines parallel to the x -axis are $y = \dots$
Lines parallel to the y -axis are $x = \dots$

Reflect Diagonally (1)

Points on the mirror line don't change position



Fold along the line of symmetry to check the direction of the reflection



Drawing perpendicular lines

Perpendicular lines to and from the mirror line can help you to plot diagonal reflections

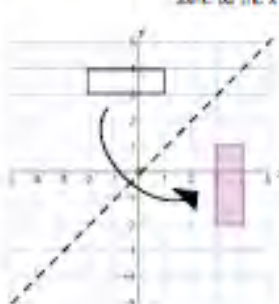
Turn your image

If you turn your image it becomes a vertical/ horizontal reflection (also good to check your answer this way)



Reflect Diagonally (2)

This is the line $y = x$ (every y coordinate is the same as the x coordinate along this line)



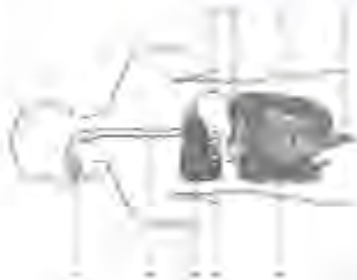
This is the line $y = -x$
The x and y coordinate have the same value but opposite sign



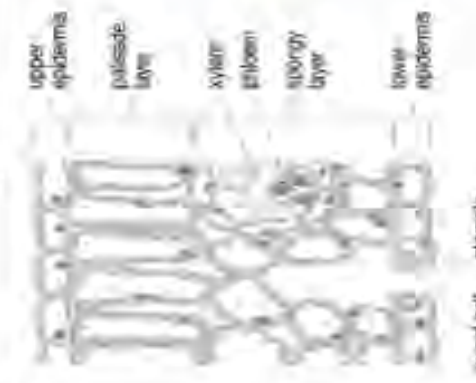
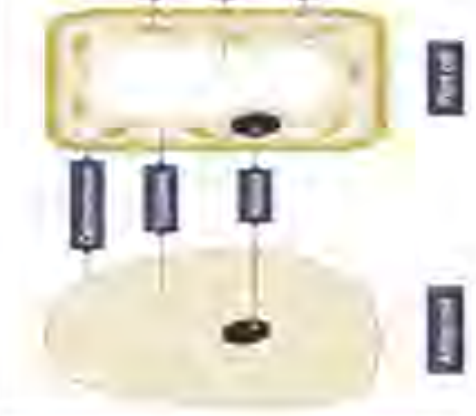
Turn your image

If you turn your image it becomes a vertical/ horizontal reflection (also good to check your answer this way)

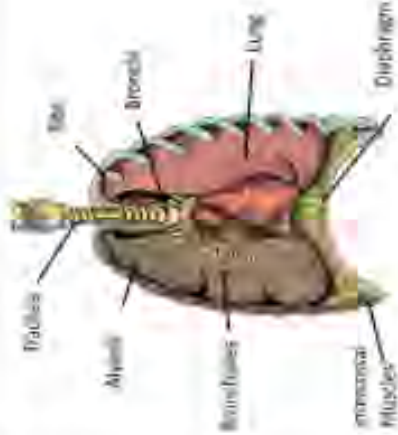
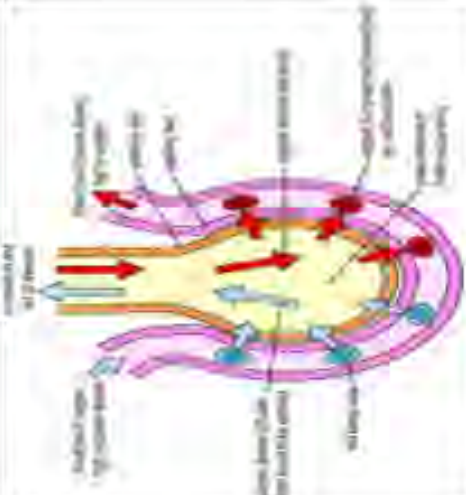
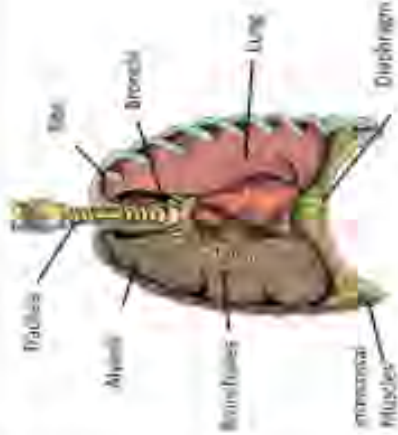
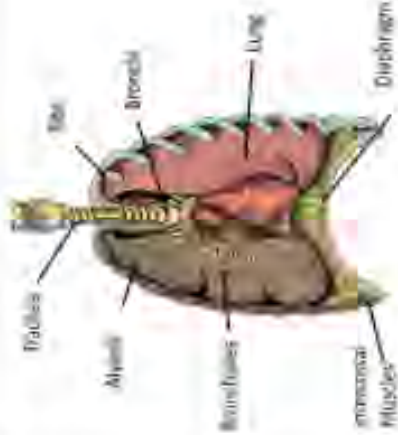
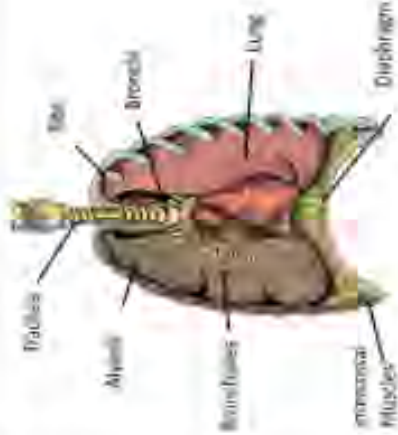
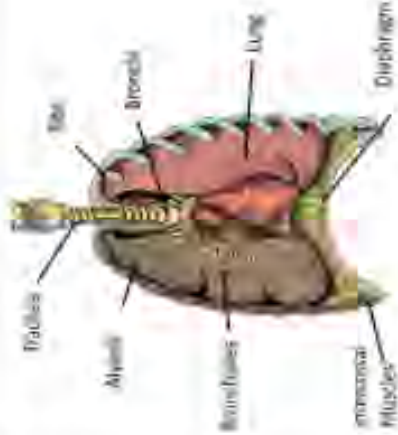
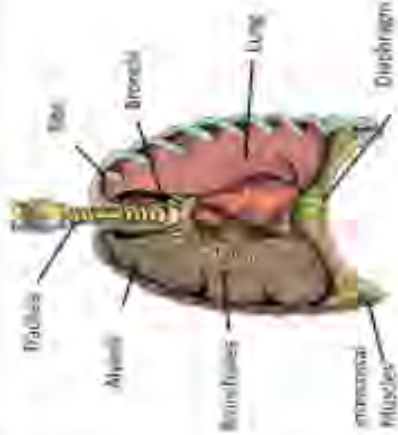
KS3 Food and Digestion

Definitions		Test for food groups	
1	Oesophagus A muscular tube that squeezes food from the mouth to the stomach. (Also known as the gullet.)	16	Starch test Iodine is orange. It will turn black in a positive test
2	Stomach A muscular organ that churns up the food. Enzymes and stomach acid are added here.	17	Sugar Benedict's solution is blue. When heated with sugar it will turn "brick red".
3	Small intestines Absorption of nutrients into the blood stream happens here.	18	Protein Biuret solution is blue. When heated with protein it will turn purple.
4	Peristalsis The muscular contraction that squeezes food down the oesophagus.	Products of digestion	
5	Protein Needed for growth and repair.	19	Amino acids Proteins are broken down into amino acids using protease enzymes.
6	Carbohydrates Needed for energy.	20	Fatty acids Fats are broken down into fatty acids and glycerol using lipase enzymes.
7	Fats Needed for insulation of nerve cells and body insulation.	21	Simple sugars Carbohydrates are broken down into simple sugars using carbohydrase enzymes e.g Amylase in saliva.
8	Flare Needed to provide the "bulk" for faeces (poop). Keeps the intestines working properly.		
9	Vitamins and minerals Help maintain general health and fitness.		
10	Enzymes Biological catalysts that speed up the rate of a reaction. Enzymes help speed up digestion.	 1. Mouth 2. Oesophagus 3. Stomach 4. Small Intestines 5. Pancreas 6. Large Intestines 7. Rectum 8. Liver 9. Gall Bladder	
11	Denatured Enzymes can be altered in shape if exposed to high temperatures or pH.		
12	Deficiency Diseases can be caused by a lack of nutrients. E.g. scurvy, anaemia.		
13	Obesity Being excessively overweight. Can result in type 2 diabetes, CHD, high blood pressure		
14	Villi Finger like structures that line the small intestines. These give a larger surface area for absorption.		
15	Digestion The break-down of large insoluble molecules into smaller soluble molecules.		
		Diagram 1: Parts of the digestive system	
		Diagram 2: Lock and Key theory.	

KS3 Plants and Photosynthesis

Definitions					
1	Photosynthesis	An endothermic reaction that plants use to make their own food using light energy	16	Xylem	Tissue in a plant that carries water up a plant stem
2	Prokaryotic	Cells with no "true" nucleus	17	Phloem	Tissue in plants that carries sugar up and down a plant
3	Eukaryotic	Cells with a true nucleus.	18	Guard cell	A cell that surround the stomata and changes in response to light intensity
4	Endothermic	A reaction that absorbs energy	Maths skills in science		
5	Chloroplasts	The organelle in a plant where photosynthesis occurs	19	Surface area	The area covering an object (length x base) x number of sides
6	Chlorophyll	The green pigment that absorbs light energy	20	Volume	The space an object takes up (length x base x height)
7	Reactant	The "ingredients" in a reaction	21	SA: V ratio	Surface area / volume
8	Products	The new things made after a chemical reaction.	22	Rate	The number of occurrences in one minute
9	Stomata	Tiny pores in a leaf where gas exchange happens	 		
10	Palisade cell	A specialised cell in a plant where lots of photosynthesis occurs			
11	Iodine	A reagent (chemical) that is used to test for the presence of starch			
12	Sexual reproduction	Making offspring with 2 parents so the offspring are genetically different			
13	Asexual reproduction	Making a genetically identical offspring (a clone) from one parent only.			
14	Diffusion	The movement of particles from an area of high concentration to an area of low concentration until equilibrium.			
15	Producer	An organism that makes its own food	Diagram 1: Cross section of a leaf		Diagram 2: Eukaryotic cells

KS3 Breathing and respiration

Definitions		Test for gases	
1	Aerobic respiration	16	Carbon dioxide
2	Anaerobic respiration	17	Oxygen
3	Fermentation	18	Hydrogen
4	Lactic acid	Respiration equations	
5	Trachea	19	Aerobic (word)
6	Alveoli	20	Aerobic (symbol)
7	Diaphragm	21	Anaerobic (word)
8	Inhale	22	Fermentation
9	Exhale		
10	Mitochondria		
11	Diffusion		
12	Pulse rate		
13	Breathing rate		
14	Limewater		
15	EPOC		

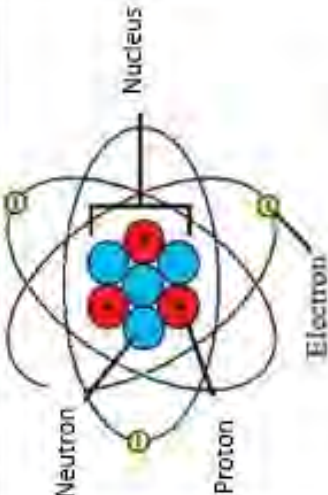
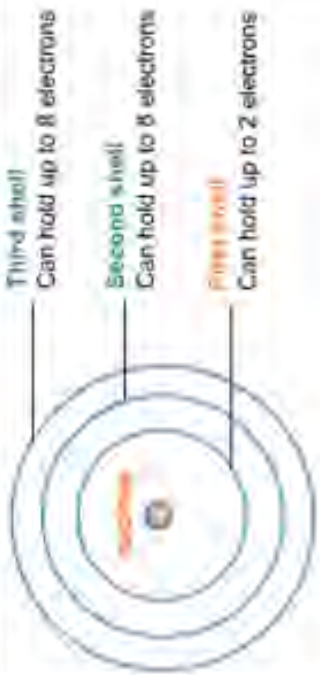
KS3 Unicellular

Definitions					
1	Prokaryotic	Cells with no "true" nucleus e.g bacteria	16	Fermentation equation	Glucose → ethanol + carbon dioxide.
2	Eukaryotic	Cells with a "true" nucleus e.g plant and animal	17	MRS GREN	7 life processes that all living organisms carry out: Movement, reproduction, sensitivity, growth, respiration, excretion, nutrition
3	Kingdoms	5 groups that all living things are categorised into.		Math skills	How to calculate Surface area to volume ratio
4	Classification	Living organisms can be classified according to their characteristics. The binomial system names an organism using its genus and species			
5	Bacteria	Unicellular organisms that are prokaryotic	19	Area	Length x width
6	Fungi	Can be unicellular (e.g algae) or multicellular (e.g yeast)	20	Surface area	Number of faces x area
7	Protoctists	Also referred to as protists, or protozoa. Eukaryotic.	21	Volume	Length x width x height
8	Decomposers	Decomposers are bacteria and fungi that break down dead plant and animal matter.	22	SA:V ratio	<u>Surface area</u> Volume
9	Diffusion	The movement of particles from an area of high concentration to low concentration, until equilibrium	 		
10	Binary Fission	Asexual reproduction in bacteria cells			
11	Microorganism	A small organism. Also known as a microbe			
12	Fermentation	Anaerobic respiration in yeast cells.			
13	Unicellular	Simple organisms made of one cell			
14	Multicellular	Complex organisms that are made of many cells			
15	Yeast Budding	Asexual reproduction in yeast cells	Fig 1: A typical bacteria cell		
			Fig 2: typical plant and animal cells		

KS3 Combustion

Definitions					
1	Exothermic	A chemical reaction that gives out energy	16	Phlogiston theory	The theory that materials that burned contained a fire-like element that was released as the object burned.
2	Endothermic	A chemical reaction that absorbs energy	17	Reactants	The things that go into a reaction. There can sometimes be just one reactant or several.
3	Hydrocarbon	A compound containing hydrogen and carbon atoms only	18	Products	The new substances that are made. This can be one product or many.
4	Combustion	The scientific name for burning.	Equations for complete and incomplete combustion		
5	Complete combustion	Burning a fuel when there is enough oxygen present.	19	Complete combustion	Fuel + oxygen $\longrightarrow$ carbon dioxide + water
6	Incomplete combustion	Burning a fuel when there is not enough oxygen present.	20	Complete combustion	
7	Oxidation	When an element combines with oxygen. E.g. Magnesium is oxidised to form magnesium oxide.	21	Incomplete combustion	Fuel + limited or no oxygen $\longrightarrow$ carbon monoxide + water
8	Reduction	When oxygen is removed from a compound e.g. Magnesium oxide is reduced to form magnesium + oxygen	22	Incomplete combustion	Fuel + limited or no oxygen $\longrightarrow$ carbon + water
9	Carbon monoxide	A toxic gas produced from incomplete combustion. Can be lethal.			
10	Greenhouse effect	The greenhouse effect is a process that occurs when gases in Earth's atmosphere trap the Sun's heat. This process makes Earth much warmer, like a greenhouse.			
11	Fuel	A substance that burns to release energy.			
12	Greenhouse gas	A gas that causes the greenhouse effect: methane, carbon dioxide and water vapour.			
13	Acid rain	Rainwater that is acidic. Caused by sulphur dioxide dissolving in water vapour in the atmosphere.			
14	Global warming	The Earth's average temperature increasing.			
15	Fossil fuel	A fuel made over millions of years from the remains of dead organisms. e.g. coal, oil and gas.			
			Fig 1: Fire triangle		Fig 2: An example of a Hydrocarbon

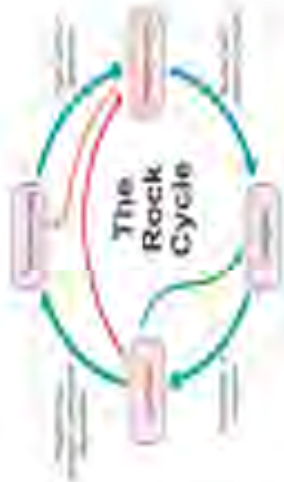
KS3 Periodic table

Definitions			
1 Elements	Contain the same type of atom	16 Atomic number	The number of protons in an atom.
2 Period	The horizontal rows on a periodic table.	17 Isotope	An element with the same number of protons but different number of neutrons
3 Group	The vertical columns on a periodic table.	18 Melting point	The temperature at which a solid will turn into a liquid
4 Mendeleev	Chemist that proposed the modern periodic table		
5 Alkali metals	Group 1 metals E.g lithium, sodium	19 Boiling point	The temperature at which a liquid will change into a gas.
6 Halogens	Group 7 elements. E.g Fluorine, chlorine	20 Symbol equation	A chemical reaction written using symbols from the periodic table.
7 Noble gases	Group 0- unreactive elements e.g Helium, Neon	21 Trend	A pattern
8 Physical	An observable characteristic e.g boiling point, melting point.	22 Anomalies	Results that don't fit the pattern. Also known as outliers.
9 Chemical	Characteristics observed as a result of a chemical reaction e.g flammability		
10 Electron configuration	The arrangement of electrons around the nucleus of an atom.		
11 Electrons	The negatively charged particles in an atom.		
12 Protons	The positively charged particles in an atom.		
13 Neutrons	The neutral particles in an atom.		
14 Atomic nucleus	The centre of an atom where the protons and neutrons are found.		
15 Atomic mass	The number of protons and neutrons in the nucleus.	Diagram 1: Structure of an atom	
		Diagram 2: Example of electron configuration	

KS3 Metals and their uses

Definitions		Investigation skills		
1 Malleable	Can be easily shaped	16	Dependant variable	The thing you measure in an investigation. Appears on the y-axis of a graph and the right hand column of a table
2 Ductile	Can be stretched into the shape of wires	17	Independent variable	The thing you change in an investigation. Appears on the x-axis of a graph and the left hand column of a table.
3 Magnetic	Can attract to magnetic materials. Only iron, cobalt and nickel.	18	Control variables	The things you keep the same to make it a "fair test". It increases the validity of your results.
4 Sonorous	Makes a ringing sound when hit.	Test for gases		
5 Dense	Particles are compacted. High mass per unit volume.	19	Carbon dioxide	Bubble carbon dioxide through limewater. It will change from clear to milky white.
6 Catalyst	A substance that speeds up a chemical reaction.	20	Oxygen	Insert a glowing splint into a test tube of oxygen. It will relight.
7 Rusting	The oxidation of iron. Only iron rusts. Other metals will corrode if they react with oxygen.	21	Hydrogen	Insert a lit splint into a test tube of Hydrogen. It will make a "squeaky pop"
8 Reactivity series	The reactivity series lists metals from the most reactive to the least reactive. A metal can displace a less reactive metal from its compounds	22	Chlorine	Damp Blue Litmus paper will turn red then white
9 Metal hydroxide	Metals that join with water form hydroxides.	metal + acid → salt + hydrogen magnesium + hydrochloric acid → magnesium chloride + hydrogen $Mg + 2HCl \rightarrow MgCl_2 + H_2$		
10 Halogen	The group 7 elements are all reactive non-metals. They react with metals to form metal halides, and with hydrogen to form acidic hydrogen halides. Reactivity decreases down the group.			
11 Corrosive	Corrosive refers to a substance that has the power to cause irreversible damage or destroy another substance by contact.			
12 Ore	solid material from which a metal or valuable mineral can be extracted for profit			
13 Alloy	A mixture of metals	Fig 1: Example of reactions of metals with acid		
14 Galvanise	Coating a metal with a protective layer of zinc to prevent corrosion.			
15 Extraction	The process of removing a metal from a compound. Can be done using Carbon (a non-metal) see <u>Reactivity series</u>	Fig 2: Chemical symbol meaning corrosive 		

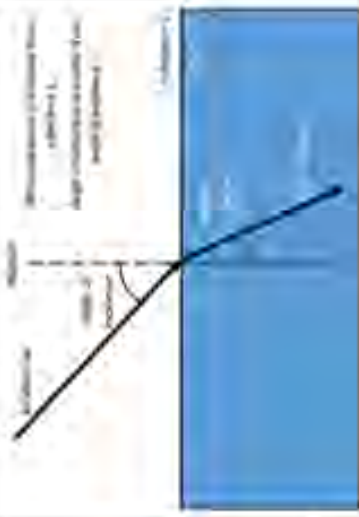
KS3 Rocks

Definitions			Examples of rocks		
1	Sedimentary	Layers of rocks are formed from sediments depositing and compacting together.	16	Sedimentary	Sandstone, mudstone,
2	Igneous	Formed from the cooling of magma and lava.	17	Igneous	Granite, pumice, obsidian.
3	Metamorphic	Rocks that are changed due to extreme heat and pressure.	18	Metamorphic	Slate, gneiss
4	Erosion	Rocks and sediments are picked up and moved to another place by ice, water, wind or gravity.	Investigation skills		
5	Weathering	Weathering is the process where rock is dissolved, worn away or broken down into smaller pieces.			
6	Biological weathering	Rocks broken down by plants and animals.			
7	Chemical weathering	Rock broken down by chemicals e.g in acid rain.			
8	Physical weathering	Rock broken down by the environment- see freeze- thaw and onion skin.	19	Independent variable	The thing you change. Goes on the x axis of a graph
9	Deposition	The landing of sediments on the ground.	20	Dependant variable	The thing you measure. Goes on the y axis of a graph
10	Magma	Molten rock under ground	21	Control variable	The things you keep the same to make your results valid.
11	Lava	Molten rock that erupts from a volcano	22	Mean	Add up all the numbers and divide by how many numbers you have added e.g $5+2+3+2 = 12 / 3 = 4$
12	Fossil	The imprint or remains of a dead organism formed over millions of years.			
13	Minerals	Each grain in a piece of rock is made from a mineral, which is a chemical compound.			
14	Freeze thaw	Water into tiny cracks expands when it freezes, causing the rock to weather.			
15	Onion skin weathering	Heat causes the rock to expand then contract when it cools, causing layers of rock to peel off.			
Diagram 1: The rock cycle					
Diagram 2: Graph skills					

KS3 Fluids

Definitions		Equations			
1	Solid	Particles are in a fixed arrangement.	16	Pressure	Force / area
2	Liquid	Have a fixed volume but no fixed shape	17	Density	Mass / Volume
3	Gas	No fixed shape or volume.	18	Volume	Length x base x height
4	Change of state	Change from one physical state to another i.e solid to liquid	Investigation skills		
5	Evaporation	Changing of a liquid to a gas.			
6	Condensation	Changing of a gas to a liquid.			
7	Melting	Changing of a solid to a liquid.			
8	Freezing	Changing of a liquid to a solid.	19	Mean	The average. Add up and divide the total by the number of values added.
9	Density	The amount of mass in a given volume.	20	Median	The middle value when listed in order
10	Float	Objects that are less dense than the liquid they are in will float.	21	Mode	The most frequently occurring number
11	Pressure	How much force is applied to something on a given area.	22	Range	The spread of the data- the highest minus the lowest.
12	Pascals	The SI unit of pressure, equal to one newton per square metre			
13	Eureka can	Can be used to calculate the volume of an irregular object.			
14	Volume	The space that an object occupies. Can be calculated by length x base x height.			
15	Mass	Mass is a measure of the amount of matter in an object. Mass is usually measured in grams (g) or kilograms (kg).			
			Diagram 1: Changes of state		
			Diagram 2: States of matter		

KS3 Light

Definitions		Primary colours of light		
1	Reflection	Waves, including sound and light, can be reflected at the boundary between two different materials.	16	Red
2	Refraction	Light changes speed and direction when it passes through a different density material	17	Blue
3	Normal	A line at right angles to a surface;	18	Green
4	Angle of incidence	The angle between the normal and incident ray	Investigation skills	
5	Angle of reflection	The angle between the normal and reflected ray,	19	Describe
6	Spectrum	A band of colours, as seen in a rainbow, produced by separation of light, based on its wavelength.	20	Explain
7	Pupil	The opening in the iris, through which light passes,	21	Plot
8	Iris	The coloured part of the eye, controls how much light passes through the pupil.	22	Evaluate
9	Cornea	The protective layer on the eye which also refracts the light.		
10	Rods	Light sensitive cells which detect light intensity.		
11	Cones	Light sensitive cells which detect colour.		
12	Virtual image	A virtual image cannot be projected on a screen		
13	Real image	The point at which rays of light focus to form an image.		
14	Prism	A prism is a transparent optical element with flat, polished surfaces that refract light.	Diagram 1: Reflection	
15	Shadow	A dark area or shape produced by a body coming between rays of light and a surface.	Diagram 2: Refraction	

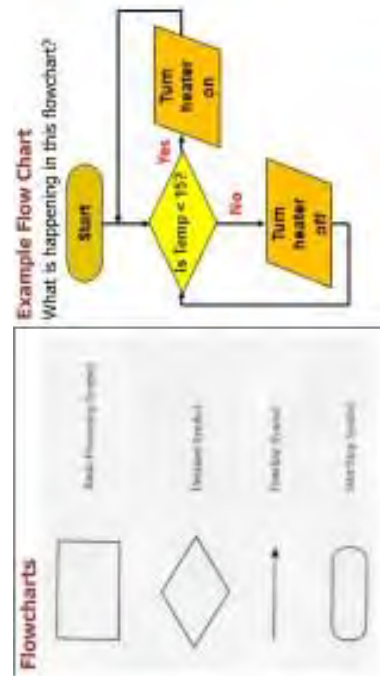
KS3 Heat transfer

Definitions		Power equations	
1 Heat	The transfer of energy from one object to another due to a difference in temperature. Heat is measured in Joules.	16	$Power = \frac{Energy\ transferred}{Time}$
2 Temperature	The temperature of an object is to do with how hot or cold it is, measured in degrees Celsius.	17	$Power = \frac{Work\ done}{Time}$
3 Conduction	The flow of heat through a solid.	18	$Power = Voltage \times Current$
4 Convection	The movement of particles in liquids and gases away from a heat source to form currents.	Investigation skills	
5 Radiation	The transfer of heat energy by electromagnetic waves that does not need particles to travel.		
6 Vacuum	An area where there are no particles e.g. Space		
7 Energy	The ability to "do work". It can never be created or destroyed.		
8 Insulation	This reduces energy transfer by conduction. Energy loss through walls can be reduced using cavity wall insulation.	19 Accuracy	How close to a true value the data is.
9 Power	The rate at which this energy is transferred is called power.	20 Precision	Several measurements of the same thing give the same results.
10 Watts	The unit for calculating power (W)	21 Random error	Caused by incorrectly reading the equipment. Digital equipment reduces this error.
11 Efficiency	As much of the input energy as possible should be transferred into useful energy stores. See Diagram 1.	22 Systematic error	Caused by errors in the equipment. These errors effect the accuracy but not the precision.
12 Dissipated	Energy that is transferred to the environment.	$Efficiency = \frac{Useful\ energy}{Total\ energy}$	
13 Thermometer	An instrument used to measure the temperature.		
14 Pay-back time	A measure of how cost-effective it is.		
15 Evaporation	A liquid changes to a gas.		
		Diagram 1: Efficiency calculation	Diagram 2: Methods of heat transfer

KS3 Earth and Space

Definitions					
1	Milky way	The name of our solar system. This includes all our planets	16	Geocentric	The belief that the Earth is fixed at the centre of the Universe.
2	Moon	A natural satellite. Earth has one moon.	17	Eclipse	An eclipse occurs when one object in space blocks an observer from seeing another object in space.
3	Satellite	Any object that is in orbit around a planet	18	Magnification	To make something bigger. See Diagram 2.
4	Orbit	An orbit is a repeating path that one celestial body takes around another. All orbits are elliptical, meaning they're egg-shaped.	Graph skills- what a good graph should have		
5	Gravity	Gravity is a force that attracts objects towards each other.	19	Correctly labelled axes	The independent variable should be on the x axis. The dependant variable should be on the y axis.
6	Waxing moon	The moon appearing bigger.	20	Scale	The axes scales should fill the page- as should the points plotted.
7	Waning moon	The moon appearing smaller.	21	Line of best fit	A line which passes through the points. This should not be a dot- to- dot. It can also curve if the points suggest this trend.
8	Telescope	An instrument that is used to see object far away.	22	Labelled axes	The axes should be labelled and include the correct units if necessary.
9	Dwarf plant	A planet that is so small that it does not affect other objects by its gravity. E.g Pluto	Sun Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune Pluto (Dwarf planet)		
10	Star	Burn hydrogen into helium in a process called nuclear fusion.			
11	Universe	Contains billions of galaxies. Theories and evidence suggest it is expanding.			
12	Solar system	The solar system includes the Sun and all the objects that orbit around it due to its gravity. This includes things such as planets, comets, asteroids, meteoroids and moons.			
13	Seasons	The Earth's axis is tilted as it travels around the Sun. This changes during the year because the Earth moves about the Sun.			
14	Equator	The equator is a line which is not real drawn around a sphere or planet	</		



```
# This program adds two numbers
num1 = 1.5
num2 = 3.3

# Add two numbers
sum = num1 + num2

# Display the sum
print('The sum of {0} and {1} is {2}'.format(num1, num2, sum))
```

```
# This program prints Hello, world!
print('Hello, world!')
```

Computing



	A	B	C	D	E	F	G
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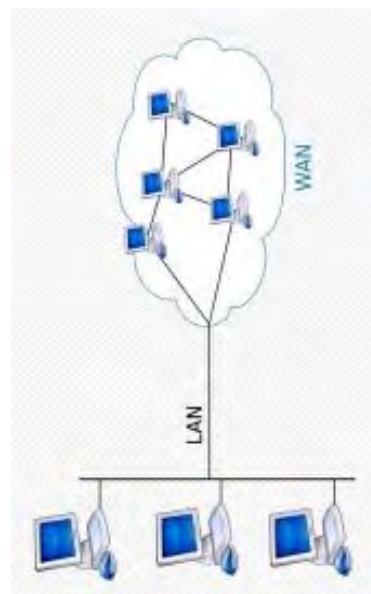
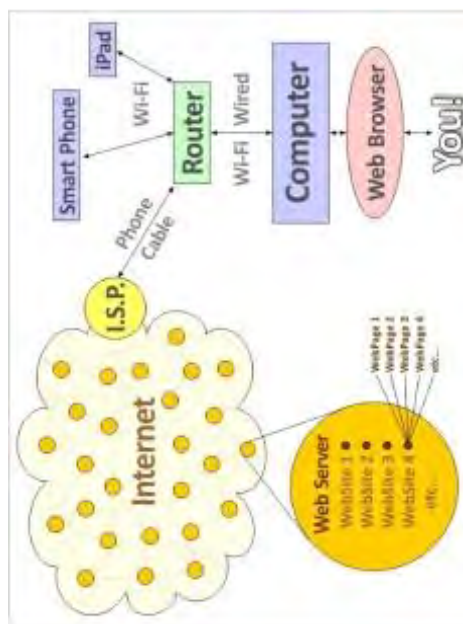
	Function	Description	Example Use	Answer
10	SUM()	Adds all the numbers in a range of cells.	=SUM(B2:B9)	210
20	AVERAGE()	Works out the average of the numbers in a range of cells.	=AVERAGE(B2:B9)	26.25
30	MAX()	Shows the largest number in a range of cells.	=MAX(B2:B9)	10
40	MIN()	Shows the smallest number in a range of cells.	=MIN(B2:B9)	50
50	COUNT()	Counts the number of cells in a range that contain numbers.	=COUNT(B2:B9)	8
70	COUNTIF()	Counts the number of cells in a range that meet a given condition.	=COUNTIF(B2:B9,10)	2
80	IF()	Checks if a condition is met and returns one value if TRUE and another value if FALSE.	=IF(B9>50,"Yes","No")	No

	A	B	C	D	E	F	G
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Knowledge Organiser: The Reformation

1	Reformation	A movement in Europe to change the Christian Church.	16	Edward VI	Henry VIII's only son (and 3 rd child) who ruled England between 1547- his death in 1553
2	Catholic	The main/ traditional branch of Christianity before 1500.	17	Mary I/ Mary Tudor	Henry VIII's eldest daughter. Married to Philip II of Spain she ruled after Edwards death until her own.
3	Protestant	A Branch of Christianity that emerged after 1500 in protest at corruption in the Catholic church.	18	Elizabeth I	Henry VIII's second daughter. She ruled after the death of Mary in 1558 until her death in 1603
4	Church of England	English branch of Christianity established in the 1500s. The monarch was the head of the church.	19	Martyr	Someone who is executed (usually burned to death) for their religious beliefs.
5	The Pope	The head of the Catholic church. He was based in the Vatican, in Rome and was one of the most powerful people on the planet.	20	Virgin Mary	Central icon of the Catholic Church and mother of Jesus. Churches were filled with statues and images of her.
6	Martin Luther	A German (Catholic) Monk who wrote a list of complaints against the Catholic Church.	21	Catholic Bible	Traditional translation of the Bible. In the 1500s these were in Latin.
7	95 Thesis	Martin Luther's list of complaints about the Catholic Church- this started the Reformation.	22	Protestant Bible	Translation of the bible by the Protestant church into the language of the country (e.g. English).
8	Act of Supremacy	A law passed by Henry VIII that made him the head of the Church of England	23	Stained glass window	Very expensive/ decorative windows found in Catholic Churches. These meant to glorify the church/ god.
9	Henry VIII	Tudor King who ruled in the 1500s and changed the Religion of the country.	24	Corruption	Misuse of power or money, usually for individual gain.
10	Catherine of Aragon	Henry VIII's 1 st wife. Originally a Spanish princess she was a strict Catholic.	25	Primary Source	A source of information created at the time of the event (e.g. a letter/ official records etc.)
11	Anne Boleyn	Henry VIII's 2 nd wife. She was raised by Protestants.	26	Secondary Source	A source of information created after the event, often from studying a lot of different primary sources.
12	Heretic	Someone who's beliefs go against the Catholic Church.	27	Provenance	The information about where a source of information has come from (who created it and why etc.)
13	Monastery	Large religious (Catholic) buildings where Monks lived- they were often very rich and powerful institutions.	28	Useful/ Utility	How useful a source is to answering a question- not to be confused with how reliable/ trustworthy a source is.
14	Mass	The central act of Catholic worship- delivered in Latin.			
15	Dissolution of the Monasteries	When Henry VIII closed all monasteries in England, taking their valuables. He claimed they were corrupt.			

Humanities: History

Tudor Life and Society Knowledge Organiser

Society in Tudor England was organised into a hierarchy . Ninety percent of Tudors lived in the countryside. Ten percent of Tudors lived in towns and cities. New social groups including citizens and the gentry were becoming more powerful and wealthy.			
Social Groups		Individuals	
Hierarchy	A social system where people are ranked according to power and wealth	Penelope Devereux	A powerful noble woman. Her brother was Robert Devereux, favourite of Queen Elizabeth.
Labourers	People who owned little or no land and worked for other people	Sir Thomas Parr	A wealthy gentleman. He owned lots of land and served the royal family in the early 1500s.
Yeomen	People who owned or rented a small amount of land. They were usually reasonably well off.	Marmaduke Bradley	A powerful abbot who controlled Fountains Abbey in Yorkshire.
Citizens	Rich people who lived in towns. They often made their money from buying and selling goods.	Concepts	
Gentry	Very wealthy people. They owned lots of land and often started off their own businesses to make money.	Hierarchy	A society organised according to who has most power and wealth.
Nobility	Often the richest people in Tudor England. They were often connected closely with the royal family.	Division of Labour	How jobs and tasks are divided between different people in an economy.
Royalty	Members of Tudor family. The most powerful became the kings and queens of England.	Grammar Schools	Schools which educated the children of wealthy gentry and merchants.
Work and Education		Utility and Source Key Concepts	
Farming	Nobles and gentry owned large areas of farmland. Most labourers were hired as farm workers.	Content	The source itself
Towns and cities	Although most Tudors lived in the countryside, towns and cities were growing bigger.	Provenance	The information about the source (eg author, date etc)
Education	Schools were not free. Only the children of rich families would go to school – and usually only boys!		Does the source contain any information which helps with our enquiry
Nayland	Our Tudor Village which is our Historic Environment study	Reliable	Can we trust the source, is the provenance trustworthy
Quills	Children in Tudor schools wrote with ink using a quill – a feather with a sharpened point.	Primary Source	A source created at the time of an event
School books	Tudor children were expected to have their own books for school.		
Greek and Latin	The focus for education in grammar schools was writing Greek and Latin. Schools also emphasised religion.	Secondary Source	A source that is created after the event has finished

Humanities: History

Year 8 History – The Civil War Knowledge Organiser

The Gunpowder Plot		Key Events
Who	A group of Catholics led by Guy Fawkes and including Robert Catesby, Thomas Winter, Thomas Percy and John Wright.	1625 Charles 1 st became King and married Henrietta Maria
What	A plot to kill the King of England James 1 st by blowing parliament up	1629 Charles dissolves parliament and rules without them; he raised money through imposing ship tax and taking forced loans
Where	A cellar under the house of Lords, Parliament in London	1640 Charles recalls Parliament he needs to get money off them to fight a war against the Scots
When	5 th November 1605 this was state opening day, when the Kings, Lords and Commons would all be present in the Lords chamber.	1641 Grand Remonstrance: Parliament published a list of over 150 misdeeds of Charles and made various demands. They also took control of the army
Why	Some Catholics felt the King was treating Catholics unfairly this was because they had to practise their religion in secret. You could be fined if you did not go to a Protestant church on Sunday.	1642 Parliament released a new set of demands in response Charles raised the Royal standard at Nottingham Castle on the 22 nd of August this signified the start of the Civil war.
	<u>Why was Charles executed in 1649?</u> He lost the civil war; he started a second civil war by getting the Scots to invade England and committed an act of treason against his own country	1648 Parliament wins the Civil war
		1649 Charles is put on trial for treason, he is found guilty and executed
1	Cavaliers The insulting nickname given to the Royalists, who fought for the King; it literally meant horsemen but inferred that they were arrogant.	6 Grand Remonstrance The Grand Remonstrance was a list of grievances presented to King Charles I of England by the English Parliament on 1 December 1641
2	Civil War A war between different groups within the same country	7 Roundheads The insulting nickname given to those who fought for Parliament.
3	Divine right of Kings A belief that the monarch was chosen by God, that their power and authority was derived from God and they had to answer to no one except God	8 Religion Charles married a Catholic Henrietta Maria which annoyed parliament. He forced the Scottish church to become more catholic by introducing a new prayer book in 1637.
4	Puritan Strict protestants who thought the Church of England had not gone far enough in removing Popish elements, they wanted a purified church.	9 Power Charles believed in the divine right of Kings and did not believe Parliament had the right to tell him what to do. He shut parliament down numerous times when they started to annoy him.
5	Ship tax A tax imposed on coastal towns in times of war to pay for the navy.	10 Money Charles had a lavish lifestyle and was running out of money, he was bankrupt. So he raised taxes without asking parliament and forced them to pay ship tax.

Y8 – British Empire Knowledge Organiser

1	A large group of states or countries ruled over by a single ruler.	Empire
2	The name used for America and the Caribbean.	West Indies
3	A trading company established in 1600. Elizabeth, I gave it the monopoly (exclusive right) to trade with India.	East India Company
4	A powerful figure appointed by the British Government in 1773 to rule India.	Governor General
5	The British took over the Dutch colony of New Amsterdam and renamed it New York	1664
6	India and Pakistan were given independence	1947
7	In 1878-114, the west European countries split up and colonised Africa	'Scramble for Africa'
8	A group of sea-raiders who were authorised by Queen Elizabeth I. They were also called "Elizabethan Pirates".	'Sea Dogs'
9	The name of the Hindu priests.	Brahmins
10	A powerful Muslim dynasty that ruled India for centuries before the British arrival.	Mughal Dynasty
11	One of the largest diamonds in the world that comes from India. It is now part of the British crown jewels.	Koh-I-Noor

Humanities: History

Y8 Industrial Revolution

Industrial Revolution		Key terms/words	
The period 1750-1900 in Britain is often referred to as the Industrial Revolution. There were lots of changes during this period.		13. Bow Street Runners	Set up by the Fielding Brothers in 1749 to solve some of the problems of Charlies.
1. Revolution	A period of rapid and significant change.	14. Night Watchmen	Patrolled towns at night.
2. Industrial	Major change in production- factories and industry could make goods quicker and cheaper than small workshops.	15. Robert Peel	Home Secretary who passed the Metropolitan Police Act in 1829 and established the Metropolitan Police Force.
3. Urbanisation	The mass migration to new towns and cities: As workers moved to work in factories, urban areas sprung up around them (like Manchester).	16. Jack the Ripper	A serial killer in Whitechapel during the period who murdered prostitutes. Never caught.
4. Transport	More goods and people needed to move from one place to another. Donkeys and dirt trails gave way to canals and railways.	17. Frederick Abberline	The detective in charge of catching Jack the Ripper.
5. Agriculture	Major change in farming creating more food with less work. Less people were needed on farms.	18. Economic effect	Effect of an event/incident on a person or countries financial situation.
6. Cottonopolis	Manchester became known by this name because textiles were so important to it.	19. Social effect	Effect of an event/incident on communities, individuals, families etc.
7. Push factor	Reason to leave a certain place, e.g. war, famine, no jobs.	20. Protest	Actions which show disapproval towards something or someone.
8. Pull factor	Reason to go to a certain place, e.g. job opportunities.	21. Luddites	Groups of English textile workers and self-employed weavers in 19 th Century that used destruction of machinery as a form of protest.
9. Cholera	One of the biggest killers during the period, caused by drinking unclean water.	22. Swing Riots	Widespread uprising by agricultural workers – began with destruction of machinery in summer 1830 and had spread throughout the whole of southern England and East Anglia by Dec 1830.
10. Public Health	Refers to the general state and promotion of health in general public. During IR main health problems were disease and lack of hygiene.	23. Spinning Jenny	Could be used in people's homes. Could produce 8 times more yarn (thread) than on a spinning wheel.
11. Factors for change	Factors which influenced change during the period, for example government, science and technology and individuals	24. Flying Shuttle	Invented by John Kay – it speeded up weaving so more cloth could be woven. Weavers saw this as a threat to their jobs.
12. "Charlies"	Initially used to prevent crime. Not particularly effective. Often volunteers.	25. Water Frame	Invented by Richard Arkwright this machine made a stronger and tougher yarn.

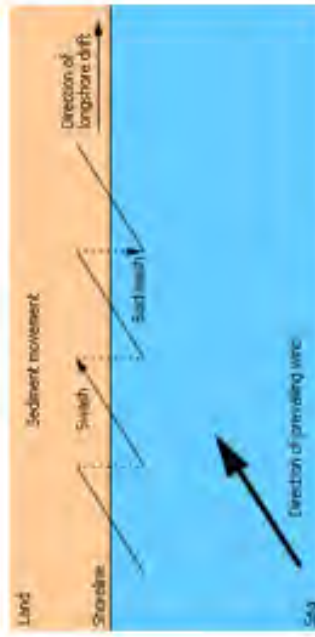
Humanities: Geography

The coastal zone knowledge organiser

Key Terms	
Fetch	The distance the wind has blown over.
Destructive waves	Weak swash and strong backwash. They remove material from the beach.
Constructive waves	Strong swash and weak backwash which takes material onto the beach.
Mechanical weathering	Breakdown of rocks and soils through contact with atmospheric conditions.
Chemical weathering	A chemical change occurs and therefore alters the rock.
Biological weathering	Living things burrow into the ground. Plant roots grow and expand cracks in the rock. Rabbits burrow into the ground.

Landforms	
Erosional landforms	Depositional landforms
- Cave, Arch, Stack and Stump - Wave cut notch and Wave cut platform - Headland and bays	- Spit, bars and tombolo's - Beaches - Sand dunes

Key Concepts	
Different processes shape the coast – weathering, mass movement, erosion, transportation and deposition.	
Coastal erosion can lead to cliff collapse creating problems for people and the environment.	
The cliffs are retreating rapidly at Holderness, Barton-on-Sea, Happisburgh where scientist estimate they are retreating by 8-10 metres a year.	
Rising sea levels will affect people living in the coastal zone.	
Coastal habitats need to be conserved, and this can lead to conflict	



Longshore drift	
Waves approach the coastline at an angle in the same direction as the prevailing wind (most common wind direction). The waves take sediment up the beach (swash) and they take the sediment back down the beach at right angles to the coast (backwash). This, therefore has an overall sediment movement to one side of the coast.	

Types of erosion (AASH)	
A ttention	Loose sediment is swirled around by the waves constantly colliding with other sediment and gradually wearing it down into smaller and rounder sediment.
A brasion	Loose rocks are thrown against the cliff. This wears the cliff away and chips bits of rock off.
S olution	Seawater dissolves material from the rock.
H ydration	Water is forced into cracks in the rock. This compresses the air inside. When the wave retreats, the compressed air blasts out which can force the rock apart.
Coastal protection	
Hard engineering (man made)	Soft engineering (working with nature)
Sea wall – concrete structure absorbs the energy of the wave.	Beach nourishment – adding more sand to the beach
Croynes – at right angles to the beach to stop LSD	Sand dune regeneration – allow sand dunes to build up around wooden structures.
Rock armour – large boulders at the foot of the cliffs to absorb energy.	Salt marsh creation – allowing the sea to flood and create a salt marsh.

Humanities: Geography

Year 8 Geography Knowledge Organiser – Development

Key Geographical Terms / Vocabulary			Key Geographical Terms / Vocabulary		
1	Term used to measure and compare areas to one another based on their different characteristics. There are many unequal differences ('Gaps') between places.	Development (GAP)	22	Either natural items which can be used / sold eg food, water, wood, gold or alternatively can include energy, services, knowledge and money.	Resources
2	Features to do with money and wealth (finances).	Economic	23	Buying and selling, or exchanging, goods and/or services between people or countries.	Trade
3	Features to do with the population, people and their lives.	Social	24	Human Development Index = a mix of indices, used by the United Nations, that show life expectancy, knowledge (adult literacy/education) & standard of living.	HDI
4	Refers to the government or the way a place is controlled. Can be linked to historical influences such as 'empires'.	Political	25	Many poorer countries have been required to borrow money but when paying it back may also need to give extra interest.	Debt
5	The ideas, customs, and social behaviour of a society.	Cultural	26	Gross National Product measures total economic output of a country, including earnings from foreign investments. (can be calculated as average per person)	GNP (per capita)
6	Geographical area (surroundings), situation or conditions in which a person lives – some people have to survive in a 'hostile environment' which impacts the activities they can do. Areas can also become degraded (depleted)	Environment	27	Gross Domestic Product = is the total value of goods and services produced by a country in a year.	GDP
7	More Economically Developed Country eg UK, USA, Japan, Germany.	MEDC	28	Means per person. Total values for a country can be divided by the population to calculate the average.	Per capita
8	Less Economically Developed Country eg Kenya, Ghana.	LEDC	29	An increase in the number of people that live in <u>an</u> location. This can be calculated by birth rate + immigration - death rate + emigration.	Population Growth Rate
9	High Income Country <u>is</u> larger salaries and greater value products.	HIC	30	money spent circulates through a country's economy. Money invested in an industry helps to create jobs directly in the industry, but it also creates jobs indirectly elsewhere in the economy.	Multiplier Effect
10	Low Income Country <u>is</u> small wages and products with far less value.	LIC	31	Term used to describe farming – if high numbers of people are working on the land this usually indicates an LEDC. Subsistence farmers only manage to grow enough for themselves so don't have extra to sell (commercial).	Agriculture
11	Newly Industrialised Countries. These were LEDCs/LICs which are now developing further. Also =New Emerging Economies.	NICs / NEE	32	Examples include farming, fishing, mining and forestry where a natural raw product is collected.	Primary Industry/ Employment
12	Ways to measure a countries level of development.	Indicator	33	Jobs in this sector are usually in manufacturing, i.e. making a product out of a raw material eg a table from wood.	Secondary Industry
13	The degree of wealth and material comfort available to a person or community.	Standard of Living	34	People in this line of work are employed to provide a service eg doctors, lawyers, teachers. Therefore they don't necessarily physically make a product.	Tertiary Industry
14	A measure of happiness or contentment people feel which is influenced by <u>a</u> number of factors.	Quality of Life	35	Consists of providing information services eg computing, ICT, consultancy, R&D (research, particularly in scientific fields).	Quaternary Industry
15	The average age to which a person lives, eg this is 79 in the UK and 48 in Kenya.	Life Expectancy	36	Conditions relating to public health, especially the provision of clean drinking water and adequate sewage disposal.	Sanitation
16	Lacking adequate amounts of money for basic needs or being on very low incomes.	Poverty	37	Occurs when a person lacks having enough good food in their diet. This can happen during a famine due to no crops. Nutrition is based on a food intake.	Malnutrition (undernourished)
17	Indicates the level of a countries education system <u>is</u> , the % of adults who can read and write. This is 99 per cent in the UK, 85% in Kenya and 60% in India.	Literacy Rates	38	Temporary homes often built by their inhabitants on land they don't own. These shacks can be referred to as 'slums', 'shanty towns', 'favelas' or a 'bustees'.	Squatter Settlement
18	The number of live births occurring among the population of an area during a given year, per 1,000 people. The term 'fertility rate' can also be used.	Birth Rate	39	Once someone has been born into a situation, it is often very challenging for them to move <u>out</u> so it repeats through the generations.	Cycle of poverty
19	The number of deaths occurring among the population of an area during a given year, per 1,000 people.	Death Rate	40	The distribution (spread) of developed countries suggests a North-South divide between economies.	Brandt Line
20	Counts the number of babies, per 1000 live births, who die under the age of one. This is 5 in the UK and 61 in Kenya.	Infant Mortality Rate	41	Many people are pushed (negatives) from the rural (countryside) and pulled (advantages) to the urban (towns & cities). Some areas become overpopulated and suffer from overcrowding with a lack of resources to share.	Migration
21	The UK has the 'Welfare State' so that taxes pay for the National Health Service. <u>However</u> many countries don't have this system and there can be many more people per doctor.	Healthcare	42	The percentage of people who live in towns and cities compared to those that remain in the countryside.	Urban / Rural Population

Humanities: Geography

A	Key words	Key concepts	B	C	D
1) Constructive plate boundary	Tectonic plate margin where two tectonic plates slide past each other.	• Structure of the earth. • Plate tectonics. • Plate boundaries • Rock types. • The rock cycle. • Volcanoes. • Earthquakes	Volcanoes	Plate Tectonics	
2) Constructive plate boundary	Magma adds new material to plates that are diverging or moving apart.				
3) Destructive plate boundary	Tectonic plate margin where two plates are converging or coming together and oceanic plate is subducted. It can be associated with violent earthquakes & explosive volcanoes.				
4) Plate boundary	The margin or boundary between two tectonic plates.				
5) Tectonic plate	A rigid segment of the Earth's crust which can 'float' around the heavier, semi-molten rock below. Continental plates are less dense, but thicker than oceanic plates.				
6) Earthquake	A sudden or violent movement within the Earth's crust followed by a series of shocks.				
7) Epicentre	The point on the surface of the Earth directly above the focus, where the shockwaves will be felt the strongest.				
8) Focus	The point below the Earth's within the crust where pressure is released and shockwaves travel downwards from.				
9) Richter Scale	A unit of measurement for the magnitude and strength of an earthquake. Typically ranges 1-10.				
10) Tsunami	Waves generated by an earthquake on the sea bed.				
11) Volcano	An opening in the Earth's crust from which lava, ash and gases erupt.				
12) Magma	Molten rock below the Earth's surface.				
13) Primary effects	The initial impact of a natural event on people and property, caused directly by it, for instance the ground buildings collapsing following an earthquake.				
14) Secondary effects	The after-effects that occur as indirect impacts of a natural event, sometimes on a larger timescale, for instance fires due to ruptured gas mains resulting from the ground shaking.				
15) Immediate responses	The reaction of people as the disaster happens and in the immediate aftermath.				
16) Long term responses	Later reactions that occur in the weeks, months and years after the event.				
17) Seismometer	Piece of equipment to measure the strength of the earthquake by recording the vibrations caused by the tremors. The vibrations are picked on a seismograph.				

Global fashion – Knowledge Organiser

1	Trade	the buying and selling of goods and services between different countries around the world.
2	Industries	economic activity concerned with the processing of raw materials and manufacture of goods in factories.
3	Consumerism	the increasing promotion and purchase of goods that buyers are interested in.
4	Globalisation	the world becoming increasingly interconnected because of increased trade and cultural exchange.
5	TNC - Transnational Corporation (Company).	Is an enterprise that is involved with the international production of goods or services, foreign investments, or income and asset management in more than one country. It sets up factories in developing countries as land and labour are cheaper there.
6	Gross domestic product (GDP)	is the standard measure of the value added created through the production of goods and services in a country during a certain period.
7	Revenue	This is all the money the company takes in from selling things.
8	Costs	This is what it spent on making and selling them (the costs of materials, wages, advertisements and so on).
9	Profit	This is extra money that the company wants in the end.
10	LIC	this is a low income country (poor).
11	NEE	This is a newly emerging economy
12	HIC	this is a high income country (rich).
13	Sweatshops	a factory or workshop, especially in the clothing industry, where manual workers are employed at very low wages for long hours and under poor conditions.
14	Stakeholder	is someone with an interest or concern in an issue.
15	Subsidy	Money given by a government to help an industry keep down the cost of exports.
16	Tax break	This reduces the amount of tax a company must pay (normally for a fixed period), therefore increasing profit.

Humanities: Geography

Year 9 Geography – Rivers Knowledge Organiser

Keywords			Drainage basin		
1	Having an ability to recover after something bad has happened.	Resilience	15	Is an area of land where rain collects	Drainage basin
2	A flood occurs when a river bursts its banks and the water spills onto the floodplain	Flood	16	The high ground that divides one drainage basin from another. The edge of a drainage basin.	Watershed
3	The impacts that affect the people and society of the area	Social effects	17	The point where a river starts.	Source
4	The impacts that affect money and jobs	Economic effects	18	Where a river flows. Often between two banks and on one bed.	Channel
5	The impacts that affect the landscape and the atmosphere	Environmental effects	19	A small river that flows into a bigger river is a tributary.	Tributary
6	The process by which water moves from the sea to the air and then to the land.	Water cycle	20	Where two rivers meet.	Confluence
7	No matter is lost or gained into the system	Closed system	21	The end of a river/ where the river meets the sea.	Mouth
8	The percentage of the Earth's surface covered by water.	70%	22	Has an impact on the rivers journey as it involves the use of technology in order to control rivers. E.g. Dams	Hard engineering
Water cycle			23	Uses a less intrusive form of management looking to work alongside natural processes. E.g. planting trees	Soft engineering
9	Warmth from the sun causes water from lakes, streams, ice, and soils to turn into water vapour in the air.	Evaporation	Flooding case studies		
10	Transpiration happens when plants give off water vapour through tiny pores in their leaves, just as people and animals sweat when they are hot! This water vapour evaporates into the air.	Transpiration	24	Cumbrian floods - The percentage of rain fell over the average in November in Cumbria	200%
11	Water vapour in the air changes back into a liquid It forms small droplets which are visible as clouds	condensation	25	Cumbrian floods - The estimated number of homes that have been affected by flooding	5,200
12	Any type of water that falls to the earth like snow, hail, mist, or rain.	Precipitation	26	Cumbrian floods - The number of homes in Cumbria and Lancashire that suffered from power cuts.	43,000
13	Water is transferred back to the sea over the earths surface	Surface water	27	Bangkok floods- the number of people that died	815
14	Ground water is water under the ground where the soil is completely filled or saturated with water. Ground water moves from high areas, like a hilltop, to places that are low. Water movement is slow.	Groundwater flow	28	Bangkok floods- The name of the river that runs through Bangkok	Chao Phraya river

Very Useful Vocab Mat

I want your opinion!

je préfère
j'adore
j'aime beaucoup
j'aime vraiment
j'aime assez
j'aime bien
je suis fan de
c'est génial!
je n'aime pas trop
je n'aime pas vraiment
je n'aime pas
je n'aime vraiment pas
je n'aime pas du tout
c'est nul!
je déteste

Watch out for common mistakes!

je m'appelle, tu t'appelles, il/elle s'appelle
j'ai quatorze ans - je suis de taille moyenne
j'ai les cheveux blonds - j'ai les yeux bleus
c'est/ça va être + **masculine adjective**
ennuyeux intéressant
mon copain, ma copine, mes copains/copines
de temps en temps
au collège - à Reading - dans ma maison

Questions

qui - who
que/qu'est-ce que/quoi - what
quel/le/quels/quelles - which
où - where
quand - when
comment - how, what (is it) like
combien - how much/many
pourquoi - why
est-ce que - just indicates it's a question

Couleurs

noir, noire; noirs, noires
rouge, rouges
bleu, bleue; bleus, bleues
vert, verte; verts, vertes
blanc, blanche; blancs, blanches
jaune, jaunes
rose, roses
marron
orange

Mois

janvier
février
mars
avril
mai
juin
juillet
août
septembre
octobre
décembre

Saisons

au printemps
en été
en automne
en hiver

Numbers

1 un
2 deux
3 trois
4 quatre
5 cinq
6 six
7 sept
8 huit
9 neuf
10 dix
11 onze
12 douze
13 treize
14 quatorze
15 quinze
16 seize
17 dix-sept
18 dix-huit
19 dix-neuf
20 vingt
21 vingt et un
22 vingt-deux
23 vingt-trois
24 vingt-quatre
25 vingt-cinq
26 vingt-six
27 vingt-sept
28 vingt-huit
29 vingt-neuf
30 trente
40 quarante
50 cinquante
60 soixante
70 soixante-dix
80 quatre-vingt
90 quatre-vingt-dix
100 cent
1000 mille
1 000 000 un million

Days

lundi mardi
mercredi jeudi
vendredi
samedi
dimanche

Comment tu t'appelles?
Quel âge tu as?
Où est-ce que tu habites?
Tu es comment? Décris-toi.
Il y a combien de personnes dans ta famille?
Quelle est la date de ton anniversaire?
Qu'est-ce que tu aimes?

J'habite à Reading, dans une grande maison.
J'ai douze ans.
Je suis petit, j'ai les cheveux noirs et courts.
Il y a mon père, ma mère, et mon petit frère.
C'est le 2 janvier.
J'aime le basket.
Je m'appelle Marie.

masculin
un frère
mon père
le stylo
du poulet

féminin
une sœur
ma mère
la trousse
de la glace

pluriel
des grands-parents
mes parents
les cahiers
des légumes

Avoid repetitions!
boring: ennuyeux, barbant
exciting: intéressant, passionnant
fun: amusant, drôle, marrant
great: génial, super, chouette, fantastique
rubbish: nul, pénible, affreux

Tenses

Past tense

Auxiliary "avoir" in present + past participle.	
J'ai tu as il/elle/on a nous avons vous avez ils/elles ont	ER – mangé IR – fini RE – vendu
Most common irregular endings :	
J'ai dit (dire)	J'ai eu (avoir)
J'ai lu (lire)	J'ai été (être)
J'ai écrit (écrire)	J'ai fait (faire)
J'ai pu (pouvoir)	J'ai bu (boire)
J'ai vu (voir)	J'ai pris (prendre)
Auxiliary « être » (+ E in feminine, S in plural):	
je suis monté je suis resté je suis sorti je suis venu je suis allé je suis né je suis descendu je suis entré je suis rentré je suis tombé je suis retourné je suis arrivé je suis mort je suis parti	
+ reflexive verbs: je me suis disputé Negative : je ne suis pas allé, je n'ai pas vu	

Present tense

Regular verbs		
ER	IR	RE
je <u>chante</u> tu <u>chantes</u> il <u>chante</u> nous <u>chantons</u> vous <u>chantez</u> ils <u>chantent</u>	je <u>finis</u> tu <u>finis</u> il <u>finit</u> nous <u>finissons</u> vous <u>finissez</u> ils <u>finissent</u>	je <u>vends</u> tu <u>vends</u> il <u>vend</u> nous <u>vendons</u> vous <u>vendez</u> ils <u>vendent</u>
Some irregular verbs		
ETRE (to be)	AVOIR (to have)	
je <u>suis</u> tu <u>es</u> il <u>est</u> nous <u>sommes</u> vous <u>êtes</u> ils <u>sont</u>	j' <u>ai</u> tu <u>as</u> il <u>a</u> elle <u>a</u> nous <u>avons</u> vous <u>avez</u> ils <u>ont</u>	
ALLER (to go)	FAIRE (to do)	
je <u>vais</u> tu <u>vas</u> il <u>va</u> nous <u>allons</u> vous <u>allez</u> ils <u>vont</u>	je <u>fais</u> tu <u>fais</u> il <u>fait</u> nous <u>faisons</u> vous <u>faites</u> ils <u>font</u>	
VOULOIR (to want)	POUVOIR (can)	
je <u>veux</u> tu <u>veux</u> il <u>veut</u> nous <u>voulons</u> vous <u>voulez</u> ils <u>veulent</u>	je <u>peux</u> tu <u>peux</u> il <u>peut</u> nous <u>pouvons</u> vous <u>pouvez</u> ils <u>peuvent</u>	
Reflexives: je me lave, tu te laves, on se lave, nous nous lavons, vous vous lavez, ils se lavent		

Future tense

Verb "aller" in present + infinitive.		
je <u>vais</u> tu <u>vas</u> il <u>va</u> nous <u>allons</u> vous <u>allez</u> ils <u>vont</u>	aller manger finir vendre aller faire avoir être	
Negative: Je ne vais pas manger		
Past	Present	Future
hier	aujourd'hui tous les jours	demain
le week-end dernier	souvent rarement	le week-end prochain
la semaine dernière	quelquefois normalement	la semaine prochaine
l'année dernière	de temps en temps	l'année prochaine
avant-hier	ne ... jamais toujours	ce week-end
il y a dix ans	en général maintenant	dans dix ans
l'hiver dernier	en ce moment en été	l'été prochain
l'été dernier	en hiver au printemps	cet hiver

Im Klassenzimmer



Wie sagt man "....." auf Englisch?	What does "....." mean in English?
Wie sagt man "....." auf Deutsch?	How do you say "....." in German?
Wie schreibt man das?	How do you spell it?
Ich verstehe nicht.	I don't understand.
Langsamer, bitte.	Speak more slowly please.
Ich habe mein Heft / Kuli vergessen.	I have forgotten my exercise book/ my pen.
Ich habe meine Hausaufgaben vergessen.	I have forgotten my homework.
Entschuldigung!	Sorry.
Ich weiß / ich weiß (es) nicht.	I know it/ I don't know.
Möchtest du mit mir arbeiten?	Do you want to <u>work</u> with me?
Wo ist....?/ Wo sind....?	Where is...?/ Where are...?
Er ist nicht hier/ sie ist nicht hier.	He is absent/ she is absent.
Ja, Herr Munn/Frau White.	Here (during registration).
Darf ich leihen?	Can I borrow....?
Darf ich ein /e/einen haben?	Can I have....?
Hast du ...?/ Haben Sie....?	Do you have.....?
Wie bitte, bitte?	Repeat please.
Ich brauche Klebstift.	I need some glue.

Useful grammar terminology

Verb	A doing word/ a being word e.g. <i>I play/ I am</i>
Infinitive	The form of the verb that you will find in the dictionary. In English it starts with 'to' and in German it ends in "en" e.g. <i>to play</i> = <i>spielen</i>
Conjugation	The process you follow when using the verb flowers to put the various endings onto the stem of the verb
Subject pronouns	I/you/he/she/it/we/you/they
Adjective	A describing word e.g. blue/ big/ bright/ bold...
Noun	A name of a person, a thing (concrete or abstract), a place, a quality... e.g. Sophie/ a house/ intelligence/ Köln / a beach/ kindness....
Connective	A word that joins up separate pieces of information to make a single more complex sentence e.g. The dog is black and he is called Jack
Tenses	Tenses represent the time frame you are talking about e.g. Present - I go to school Past - I went to school Future - I am going to go to school/ I will go to school



1	eins	31	einunddreißig
2	zwei	34	vierunddreißig
3	drei	40	vierzig
4	vier	50	fünfzig
5	fünf	60	sechzig
6	sechs	70	siebzig
7	sieben	71	einundsiebzig
8	acht	72	zweundsiebzig
9	neun	73	dreundsiebzig
10	zehn	74	vierundsiebzig
11	elf	75	fünfundsiebzig
12	zwölf	76	sechundsiebzig
13	dreizehn	77	siebundsiebzig
14	vierzehn	78	achtundsiebzig
15	fünfzehn	79	neunundsiebzig
16	sechzehn	80	achtzig
17	siebzehn	81	einundachtzig
18	achtzehn	87	siebenundachtzig
19	neunzehn	90	neunzig
20	zwanzig	91	einundneunzig
21	einundzwanzig	94	vierundneunzig
22	zweiundzwanzig	96	sechsundneunzig
23	dreiundzwanzig	98	achtundneunzig
24	vierundzwanzig	100	(ein) hundert
25	fünfundzwanzig	162	einhundertsechundfünfzig
26	sechsundzwanzig	200	zweihundert
27	siebenundzwanzig	1000	(ein) tausend
28	achtundzwanzig	3884	dreitausendachtundachtzig
29	neunundzwanzig		
30	dreißig		

Die Tage

Montag
Dienstag
Mittwoch
Donnerstag
Freitag
Samstag / Sonnabend
Sonntag

Die Monate

Januar
Februar
März
April
Mai
Juni
Juli
August
September
Oktober
November
Dezember

Meinungen

ausgeszeichnet	Ich denke	I think that
prima - klasse, toll	Ich finde	I think that
gut, sehr gut	meiner Meinung nach	In my opinion
befriedigend	es ist	It is
mangelhaft	sie sind	They are
ungenügend	es war	It was
furchtbar	es wird ...sein	It will be
	ich mag es...	I like it
	es hat mir gut gefallen	I liked it

rot	grün	blau
gelb	schwarz	weiß
rosa	orange	braun
grau	violett	bunt

THE	A	SOME	engl.	franz.	neuter	plural
der	ein	-	die	eine	das	die
und	aber	auch	and	but	also	however
weil	weil	weil	because	because	if	although
wenn	obwohl	mit	where	because		
da	wo	weil				

Time phrases

normalerweise	normally
immer	always
ab und zu	from time to time
manchmal	sometimes
nie	never
jetzt	now
Heute	today
im Winter	in Winter
im Sommer	in Summer
im Herbst	in Autumn
im Frühling	in Spring
jede Woche	every week
einmal pro Woche	once a week
gestern	yesterday
letzte Woche	last week
letztes Jahr	last year
nächste Woche	next week
nächstes Jahr	next year
morgen	tomorrow
in der Zukunft	in the future

Adjectives go before the noun and so are like English, but they can change their spelling !

GRAMMAR NOTES LEARNING MAP KS3

Who does what?

ich = I
du = you (familiar)
er = he
sie = she
es = it
wir = we
ihr = you lot (familiar)
Sie = you polite
sie = they

Present Tense - Regular

ich - e
du - st
er - t
sie - t
es - t
wir - en
ihr - t
Sie - en
sie - en

spielen
TAKE OFF THE EN
→ spiel + endings

haben = to have

ich habe
du hast
er hat
sie hat
es hat
wir haben
ihr habt
Sie haben
sie haben

sein = to be

ich bin
du bist
er ist
sie ist
es ist
wir sind
ihr seid
Sie sind
sie sind

werden = to become

ich werde
du wirst
er wird
sie wird
es wird
wir werden
ihr werdet
Sie werden
sie werden

können – to be able to

ich kann
du kannst
er kann
sie kann
es kann
wir können
ihr könnt
Sie können
sie können

müssen – to have to

ich muss
du musst
er muss
sie muss
es muss
wir müssen
ihr müsst
Sie müssen
sie müssen

wollen – to want to

ich will
du willst
er will
sie will
es will
wir wollen
ihr wollt
Sie wollen
sie wollen

dürfen – to be allowed to

ich darf
du darfst
er darf
sie darf
es darf
wir dürfen
ihr dürft
Sie dürfen
sie dürfen

Modal Verbs are

always used with the
infinitive of another verb –
eg I can play football.
In German the infinitive goes
at the end of the sentence.
Ich kann Fußball spielen

was / were
ich war – I was
es war – it was
wir waren
– we were
sie waren
– they were

EXTRAS

sollen – to should!

ich sollte – I should
er sollte – he should
wir sollten – we should

Joining things

und / aber / denn – no change in words order
weil / dass / obwohl - send the verb → end
, weil es gut ist // ich finde, dass Fußball gut ist.

Comparing things

besser als nicht so gut wie
größer als nicht so groß wie
kleiner als nicht so klein wie

Future Tense

Present tense of werden + infinitive at the end of the phrase.

ich werde Fußball spielen.

wir werden nach Deutschland fahren.

Alternatives

Ich möchte Fußball spielen – I would like to play football.

ich will Fußball spielen – I want to play football

Perfect Tense

Regular verbs – add ge and take off the en and add a t
spielen → gespielt.

Add the correct part of 'haben' and 'sein' and the past participle (ge word) goes to the end of the phrase.

ich habe Fußball gespielt.

ich bin nach Leeds gefahren

You use haben for most verbs and sein for verbs of motion + to stay

Irregular Past Participles

to get	bekommen	bekommen
to visit	besuchen	besucht
to eat	essen	gegessen
to find	finden	gefunden
to win	gewinnen	gewonnen
to sleep	schlafen	geschlafen
to read	lesen	gelesen
to see	sehen	gesehen
to wear	tragen	getragen
to meet	treffen	getroffen
*to travel	fahren	gefahren

Spanish

GIVING OPINIONS

Me gusta	I like
No me gusta	I don't like
Me gusta mucho	I really like
No me gusta nada	I don't like it at all
Me encanta/Me chifla	I love
Odio	I hate
No aguanto	I can't stand
Creo que/Pienso que	I think that
En mi opinión	In my opinion
Prefiero	I prefer
Personalmente	Personally

CONJUNCTIONS - CONNECTIVES

Y	And
Pero	But
Porque	Because
También	Also
Sin embargo	However
Aunque	Although
Además	Moreover
Así que	So
Por un lado	On one hand
Por otro lado	On the other hand

SEQUENCERS

Primero	First
Luego	Then/Next
Después	Afterwards
Más tarde	Later on
Finalmente	Finally

TIME MARKERS - PRESENT

Normalmente	Normally/Usually
Siempre	Always
Nunca	Never
A veces	Sometimes
Cada <u>día</u>	Every <u>day</u>
Ahora	Now

TIME MARKERS - PAST

Ayer	Yesterday
El <u>lunes</u> pasado	Last <u>Monday</u>
La semana pasada	Last week
El fin de semana pasado	Last weekend
El mes pasado	Last month
El año pasado	Last year
Anoche	Last night

TIME MARKERS - FUTURE

Mañana	Tomorrow
El próximo <u>lunes</u>	Next <u>Monday</u>
La próxima semana	Next week
El próximo fin de semana	Next weekend
El próximo mes	Next month
El próximo año	Next year

QUANTIFIERS - INTENSIFIERS

Muy	Very
Bastante	Quite
Un poco	A little/A bit
Cada	Every/Each
Demasiado	Too (much/many)
Mucho	much/many/lots of/a lot of

USEFUL VERBS

Es	He/She/It is
Son	They are
Soy/Estoy	I am
Tengo	I have
Hay	There is/are
Puedo	I can
Quiero	I want
Hago	I do/make
Voy	I go

QUESTIONS

¿Qué?	What?
¿Por qué?	Why?
¿Dónde?	Where?
¿A dónde?	Where (to)?
¿Cuándo?	When?
¿Cómo?	How?
¿Cuánto?	How much?
¿Quién?	Who?

THE WEATHER

Hace sol	It is sunny
Está nublado	It is cloudy
Está lloviendo	It is raining
Hace frío	It is cold
Hace calor	It is hot
Hace viento	It is windy
Está nevando	It is snowing
Hay niebla	It is foggy

ADJECTIVES - POSITIVE

Divertido	Funny/Amusing
Interesante	Interesting
Genial	Great
Guay	Cool
Entretenido	Entertaining
Emocionante	Exciting
Estimulante	Stimulating
Relajante	Relaxing
Increíble	Incredible
Útil	Useful
Sensacional	Sensational
Agradable	Nice
Fácil	Easy

ADJECTIVES - NEGATIVE

Aburrido	Boring
Molesto	Annoying
Horrible	Awful
Raro	Strange/Rare
Estresante	Stressful
Agotador	Tiring
Iniútil	Useless
Asqueroso	Disgusting
Difícil	Difficult
Irritante	Irritating

MAKING COMPARISONS

Más... que	More... than
Menos... que	Less... than



ESPAÑOL

Year 8 RE Knowledge Organiser

1. Forgiveness Forgiveness is a central value to Christians as they believe that Jesus died on the cross to forgive all humans for their sins. The Lord's Prayer – a central model prayer for Christians given by Jesus also mentions the importance of forgiveness. And forgive us our sins, as we forgive those who sin against us. CASE STUDY: Gee Walker Gee and Dominique Walker are Christians. Dominique mentions forgiving "70 times 7". This is from a conversation Jesus had with his disciples when he tells them how many times they should forgive. Rather than counting how many times you forgive, Jesus is saying always be forgiving. He put this into action when he was dying on the cross and he forgave the people who were crucifying him. For religious people, forgiveness is an important concept. They know they have done wrong things (sins) in their lives so want to be forgiven by God for those. But first, they have to forgive people who have wronged them. Even though this is hard, they explain it helps them to move forward without bitterness.	2. Wealth and poverty Muslim teachings on wealth • All wealth is a blessing from Allah • Wealth belongs ultimately to Allah and should be distributed fairly • There is a responsibility to help the poor • Too much wealth can be a distraction from God • "And those who hoard gold and silver and spend it not in the way of Allah - give them tidings of a painful punishment" (Qur'an 9:34) Christian teachings on wealth and poverty A parable is a story with a significant moral or meaning. The Parable of the rich man and Lazarus warns people not to store up wealth on earth and ignore the needs of the poor. If you do this you will not go to heaven in the afterlife. Uses and responsibilities of wealth • Christianity- wealthy are responsible for helping others and the Church • Parable of the Rich Man and Lazarus (Luke 16: 19-31) • Parable of the Sheep and Goats (Matthew 25:31-46) • Islam- duty of the husband to provide financially for the family • After this has been done, obligation to give Zakah • Encouraged to give voluntary charity- sadaqah.	3. Equality. MLK & Malcolm X Equality the principle of fairness - the idea that people in society are treated the same no matter what they might look like or what social group they belong to. Prejudice is an attitude, meaning to judge someone before knowing them. We often judge something or someone based on assumptions. Discrimination goes a step further and is when prejudiced thoughts influence actions. It involves unjust treatment resulting from prejudice. Stereotyping is a set way of viewing certain people based on their race, religion, age etc. <table><tr><td>Differences between MLK & Malcolm X</td><td></td></tr><tr><td>MLK Expose the racism, prejudice, discrimination, & brutality that existed in the South. Use non-violent means to promote the change he wanted</td><td>Malcolm X Believed African-Americans should stand up and fight for their freedom Believed violence was necessary to earn freedom Believed that the Christian religion was based on the white culture.</td></tr></table>	Differences between MLK & Malcolm X		MLK Expose the racism, prejudice, discrimination, & brutality that existed in the South. Use non-violent means to promote the change he wanted	Malcolm X Believed African-Americans should stand up and fight for their freedom Believed violence was necessary to earn freedom Believed that the Christian religion was based on the white culture.	4. Peace & Conflict: Pacifism Pacifism is the belief that all instances of violence and war are wrong and should be avoided. A person who believes in this is called a pacifist. Pacifism promotes the principle of the sanctity of life – the belief that life is holy because it is God given. Pacifists reject all violence. They do not think that conflict should be dealt with by resorting to war. They think that other peaceful methods should be used. The early Christians interpreted Jesus' commandments to mean that they could not fight in wars or be violent. They also look to the example of Jesus' life for further reasons to be pacifists. When the guards came to arrest Jesus he did not fight back and he commanded his disciples to allow him to be taken. Pacifists also use the teaching in the Ten Commandments to justify their position. In Exodus it says: Do not murder. Today there are pacifists in most Christian denominations. Some examples of pacifist groups are the Mennonites, the Amish and the Meeting of Friends in Wales (Quakers).
Differences between MLK & Malcolm X							
MLK Expose the racism, prejudice, discrimination, & brutality that existed in the South. Use non-violent means to promote the change he wanted	Malcolm X Believed African-Americans should stand up and fight for their freedom Believed violence was necessary to earn freedom Believed that the Christian religion was based on the white culture.						
5. Peace and Conflict: The JWT The Just war theory was put forward by • The war must be declared by the government of a country. • It must have a just cause. • It should have a just intention (such as to correct evil and bring about good) • It should be the last resort (everything else should have been tried first)		6. Peace and Conflict: Jihad Jihad is the struggle Muslims should have to be a good Muslim – there is lesser and greater Jihad. Greater jihad - Greater jihad is the personal, inner struggle to be a good Muslim and to improve spiritually. It is a constant duty and is seen as an act of worship.					

- It must have a good chance of being successful and bringing about peace - Must be in proportion (it should not kill too many people, especially if they are not involved in the fighting)	Lesser jihad Lesser jihad is about defending Islam from threat. While the majority of Muslims see their religion as one of peace, sometimes Muslims have taken up arms against enemies when they or other Muslims have been persecuted. The Qur'an says: Permission [to fight] has been given to those who are being fought, because they were wronged. And indeed, Allah is competent to give them victory (Surah 22:39). While the Qur'an allows violence to defend Islam, it warns against going beyond the limits of what is necessary for this defence: Fight in the way of Allah those who fight against you but do not transgress. Indeed, Allah does not like transgressors (Surah 2:190). Similarly, every opportunity should be seized to make peace with an enemy: If the enemy is inclined towards peace, do make peace with them, and put your trust in Allah. He is the One Who hears all, knows all (Surah 8:61). Any form of war must be approved by a religious leader, fought in self-defence and not used to either convert people to Islam or gain land.		
7. Extremism Extremism: The holding of <u>extreme</u> political or religious views. Terrorism: The unofficial or unauthorised use of violence and intimidation in the pursuit of political or social aims.	8. Prejudice and Discrimination Prejudice refers to biased thinking, discrimination consists of actions against a group of people.	9. Religious freedom In the UK it is legal to express any religious or non-religious belief as long as it does not incite violence or express hatred for others. It is also forbidden to persecute others from another faith or none. This is one of our human rights. "There shall be no compulsion in [acceptance of] the religion" (Qur'an 2:256) "Fight those who do not believe in Allah or in the Last Day" (Qur'an 9:29)	10. Was the world created? Some people believe that the creation story taken from the Bible is just that: a story. They believe it is a story with a meaning behind it. Some Christians would be very upset to think that this is a story and would take the creation story to be a literal event that actually took place.
11. The design & cosmological argument 'teleological' comes from the Greek word 'telos' – meaning 'design' or 'purpose' The cosmological argument is based on the fact of the universe's <u>existence</u> : (All things that exist must have a cause. Therefore, the 'first cause' [the cause of everything including itself] is God.) William Paley's argument from design William Paley (1743-1805), in his book <i>Natural Theology</i> , made the argument that the complexity & efficiency of natural objects (eg. the eye, the brain, etc.) are evidence that they must have been purposefully designed. How else could they have come to be as they are – perfectly adapted for the purpose they serve?	12. Do miracles happen? A miracle may be defined as: (1) a real, individual event, the occurrence of which must be (or must have been), at least in principle, susceptible to empirical verification; (2) an event which must be extremely unusual or historically unprecedented from. A miracle is an extraordinary event that goes against nature, cannot be explained by science and that Christians believe is caused by God. In Matthew's day, people would have believed in miracles and did not need any scientific explanations or proof. Instead, he focused on the amazing things Jesus could do through the power of God.		

Year 8 Citizenship Knowledge Organiser

1. What are laws and why do we need them? Law is a system of rules that a country or community have agreed and follow. It regulates your actions so that if you break the law, then there could be penalties. - Laws state what your rights are and what your duties are under that law. - Each country has its own laws that everyone has to obey, including visitors if they are not a citizen of that country. - The law states what the penalties are for anyone who breaks the law. - There is a police force to keep order and to stop people breaking the law, and to arrest them if they do. Ignorance of the law is not regarded as a valid excuse if you are found breaking the law. Legal age limits: mean a person can't take part in certain activities until they reach the correct birthday.	2. How laws are made civil and criminal? Parliament has two chambers: The house of common- elected chamber The house of lords- experts in their fields, bishops and peers What do MPs do? Represent the people Debate the issues of the day in the House of Commons Vote on Laws Put questions to the Government about their decisions How laws are made: A proposal for a new law is called a bill. Bills are usually introduced by the government, although some are proposed by individual MP's. The bill must pass through several stages before it becomes an Act of Parliament. Each bill has to pass through three 'readings' in both the House of Commons and the House of Lords. Laws about crime such as theft, vandalism, and assault, which the government enforces, are part of what is called Criminal Law. Laws concerning your private rights, in your dealings with other people, such as borrowing and lending money, are part of what is called Civil Law.	3. How can citizens change the law? Fairness is about treating people equally or in a way that is considered right or reasonable. It's also about making sure people have equal access to justice in the eyes of the law. We have an obligation to each other to be fair, so the decisions we make are free from discrimination. A campaign to change the law - Research and find out what needs to change - Get support- meetings, social media, surveys - Start a petition/ e-petition, lobby politicians - Share your story far and wide: newspapers, TV, Internet - Get support from the government Why might people think it too difficult to change the law It takes too long It can be surprisingly quick and it is very rewarding to know you have made a difference The important politicians won't listen to me It is a politicians job to represent citizens 6. Power and Control A political party with the majority of councillors can run the council and make decisions. In MCC the Labour Part hold the majority of seats They can they make decisions and not worry about being blocked by an opposition political party. A manifesto is a set of written pledges to voters about what a political party or local candidate would do if elected. In a democracy, candidates want to win votes and are therefore more likely to support causes that a large number of voters care about.	4. How do UK Elections work? You have to be 18 years old on the day of the election 'polling day'. You must be either a British, Irish, Commonwealth or EU citizen*. You can register to vote from the age of 16. You must be registered at an address in the area you want to vote in. You can't vote if you are serving a prison sentence. You cannot vote if you are detained in a mental health hospital for treatment. First-past-the-post voting system the winner is the candidate who gets the most number of votes. It is an easy system to understand for voters. Voters just put a X next to their chosen candidate, but it does mean that the winner may not have the majority of votes. A political party is a group of people who share a common view on issues.
5. Why is registering to vote so important? Voter registration drives: encourage people to register to vote and have their say Young people are the least likely, out of all groups in society to be registered to vote and go on to vote at elections. This means that your voice, views and opinions will not influence important issues such as education, health, leisure and work - which affect you, your family and friends.			

Social Science: Citizenship

7. How is the UK Government structured? The Monarch (The Queen) is Head of State- gives final approval to laws, opens Parliament in a ceremony each year, appoints the Prime minister, is politically neutral (does not belong to any Political Party) The Prime Minister- leader of the Government. The Prime Minister has overall responsibility for the policy and decisions of the government. Cabinet Ministers- run government departments e.g., Health and Education			
9. How do we protect the right to health? Article 24: You have the right to healthcare when you are sick, to healthy food, clean water, a clean environment, and information to help you stay healthy. Rich countries should help poorer countries do this. Dis-information- information which is deliberately created to harm a person, group or organisation Mis-Information- information shared without knowing it is false; not created to cause harm Mal-information- truthful information which is shared to deliberately harm a person or group	10. Are you getting your right to reliable and accurate information? Article 17 (access to information from the media) Every child has the right to reliable information from a variety of sources, and governments should encourage the media to provide information that children can understand. Governments must help protect children from materials that could harm them. Why is it important? Children must be given space, inclusive opportunities to form and express their views. Children must be facilitated to express their views. Children must be facilitated to express their views. Their view must be acted upon, as appropriate.	11. What rights are under threat for child asylum seekers Why people are forced from their homes? war or fighting between different groups of people. being treated unfairly (discriminated against); speaking out against the government which has put the person's life in danger. Child exploitation An internally displaced person is forced to flee their home because of war or persecution but stays in their own country A refugee is someone who flees their country because of risk of persecution and terror and has been given refugee status by another country An asylum seeker is someone who left their country and is asking another country to see them as a refugee to protect them from the dangers in their country they would become a refugee	12. Why do we need equality laws? Equality- Ensuring that every individual has an equal opportunity to make the most of their lives and talents. - We need rules to protect ourselves and each other, to keep us all safe wherever we go. - People in public need to know what they can and cannot do. We all need to be able to live together peacefully. - We need to make sure that everybody is treated fairly and that nobody is discriminated against. The Equality Act 2010 legally protects people from discrimination in society. This replaced the previous anti-discrimination laws with a single Act, making the law easier to understand and strengthening protection in some situations. It sets out the different ways in which it's unlawful to treat someone.
13. How much progress have we made on equality in the UK? Types of discrimination- racism, sexism, disablism, homophobia etc - Alan Turing 1912 –1954 English computer scientist and mathematician lived and worked in Manchester - It has been estimated that this work shortened the war in Europe by more than two years and saved over fourteen million lives. - Turing was prosecuted in 1952 for having same-sex relationships, which was still a criminal act in the UK. - Turing was prosecuted in 1952 for having same-sex relationships, which was still a criminal act in the UK.	14. How can we make a fairer community? The Equality Act 2010 makes it law that every private, public and voluntary organisation must not discriminate against employees and people that use their services because of particular characteristics. The Act brings together all previous equality laws, making them simpler, more effective and easier to understand. Stephen Lawrence murdered 22 April 1993, at the age of just 18. An unprovoked racist attack. He didn't know his killers and his killers didn't know him. A public inquiry into the handling of Stephen's case was held in 1998, leading to the publication of the Macpherson Report, led to profound cultural changes in attitudes to racism, to the law and to police practice.		

3D Design: Souvenir Clock (Designing for others)

Key Learning Aims

Identify and work with a range of materials taking into account their physical and working properties and qualities
Safety use a range of workshop tools, equipment, machines and processes within a workshop environment
Produce design proposals based on a design brief and effectively communicate the ideas using a range of different techniques and taking account of any research carried out
Understand the wider influences on design including scales of production, product lifecycles, planned obsolescence and sustainability

Materials & Properties

Working properties are how a material behaves when it is manipulated.

Strength - the ability of a material to withstand compression, tension and shear

Hardness - the ability to withstand impact without damage

Toughness - materials that are hard to break or snap are tough and can absorb shock

Malleability - being able to bend or shape easily would make a material easily malleable

Ductility - materials that can be stretched are ductile

Elasticity - the ability to be stretched and then return to its original shape

Material Stock Forms



Physical properties are the traits a material has before it is used.

Absorbency - the ability to soak up moisture, light or heat

Density - how solid a material is. This is measured by dividing mass (grams) by volume (cm³)

Feasibility - the ability of a material to be heated and joined to another material when cooled

Electrical conductivity - the ability to conduct electricity

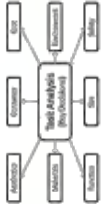
Thermal conductivity - the ability to conduct heat

Techniques

Isometric - An isometric grid is drawn with lines at 30 degrees and 90 degrees to the horizontal.



Mind Map - a diagram used to visually organize information into a hierarchy, showing relationships among pieces of the whole.



Cutting Processes Removal or unwanted material using saws, files and drills

Joining Processes Assembling parts together using permanent or semi-permanent methods like glues, nuts and bolts and wood joints (Dowel and Comb Joints)

Finishing Processes The application of a substance to change the aesthetics, function or to protection

Equipment & Tools



Health & Safety

Workshop Health and Safety Rules Risk Assessment - Identifying potential dangers and how likely they could occur

- 1) Bags and Coats stored on the storage racks
- 2) Blazer removed, hair tied back, sleeves rolled up
- 3) Stools tucked under and standing up when using tools
- 4) Watch and follow health and safety demonstrations and use PPE provided
- 5) Use PPE provided
- 6) Clear away tools, equipment, waste material at the end of a lesson

Personal Protective Equipment (PPE)



Further Reading

Now Make This: 24 DIY Projects by Thomas Heatherly
Building with Second hand stuff: How to reclaim, revamp, repurpose, and reuse salvaged and leftover building materials. By Chris Peterson
No More Plastic - Martin Dorey
Why Shrink Wrap a Cucumber
The Design Thinking Playbook Wiley
How to Build a Car: The Autobiography of the World's Greatest Formula 1 Designer and cover by Adrian Newey

Watch	Visit
BBC Big Life Fix	Wollaton Hall Industrial Museum
BBC The Inventors	Carkers
BBC How to Build...	The Museum of Making - Derby

Key Words

Adhesive - Glue. Adhesives are used to bond or glue materials together.
Batch production - Production of identical artefacts in limited numbers
Comb joint - Comb finger joints are simple square cut interlocking joints. The finished effect is not only strong but aesthetically pleasing.
Coping saw - A framed saw with a narrow blade. The blade makes it possible to saw around curves.
Dowel - A piece of wood which is perfectly round in section.
Machine - a device which does work using moving and fixed components
Mass production - making very large quantities of products
Quality - How well made and effective the product is. Quality assurance is carried out by regular testing against specification criteria. Quality control is the name given to the testing and correction procedures when manufacturing
Router - A power tool used in woodwork. The cutting bit revolves at very high speed and can be used to cut grooves, rebates and decorative mouldings on timber.
Template - a pattern or gauge used when marking or cutting out.
Try square - An L-shaped tool which is used to check for squareness.

Engineering: Dice & Games Designing for others)



Year

8

Key Learning Aims

Identify the benefits of Integrated circuits over the use of traditional components
Creation of a working electronic product

Materials & Properties

Component Symbol



Switch



Resistor



Led

Integrated circuit (IC)

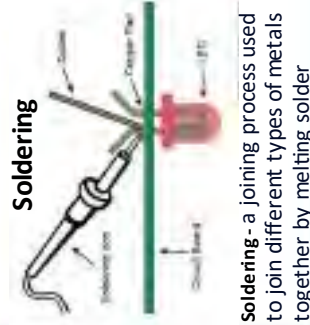


Equipment & Tools

Soldering iron a hand tool that melts solder so two pieces of metal can be joined, commonly used for plumbing and electrical work.
Soldering iron stand is used to keep the hot soldering iron away from you and the work area.
Heat proof mat are usually made from a ceramic material. They are placed underneath hot objects to protect the table.
Desoldering pump also known as a solder sucker, is a device used to remove molten solder from a joint.
Wire cutters are commonly used to cut copper, brass, iron, aluminium, and steel wire. Some wire cutters have insulated handles, ensuring you will not get shocked.
Solder is a metal alloy with a low melting point that's used to create joints between metal components when soldering.

Techniques

Soldering



Soldering - a joining process used to join different types of metals together by melting solder

CAD/CAM

Computer-aided design (CAD) is a manufacturing process that allows us to digitally create 2D drawings or 3D models of future products.

Computer Aided Manufacturing (CAM) is the use of software and computer controlled machinery to automate a manufacturing process



Health & Safety



Key Words

integrated circuit (IC) sometimes called a chip, microchip or microelectronic circuit, is a semiconductor wafer on which thousands or millions of tiny resistors, capacitors, diodes and transistors are fabricated.

non-polarized can be connected in any direction and still function the way it's supposed to function

Polarized - a component with polarity can only be connected to a circuit in one direction

System diagram A systems diagram is a visual model of a system, its components, and their interactions. It describes the necessary inputs and outputs of a system.



Further Reading

<https://technologystudent.com/elec1/ic1.htm>
<https://technologystudent.com/elec1/ic2.htm>



Art: Beach House



Key Learning Aims

To learn how to draw with a grid, To learn how to draw with 2 point perspective, To learn how to create a building design, To learn how to construct in cardboard, To learn how to use colourpop to enhance my design.

Materials & Properties

How to draw an urban scene using grids:
<https://www.youtube.com/watch?v=zgFQ6QGfPeA>
How to draw a building with two point perspective:
https://www.youtube.com/watch?v=ZZuY55mqR_Q
Examples of drawing variety in pen:
<https://www.youtube.com/watch?v=Rxi65IXgBjo&t=521s>
How draw a building with mark making detail:
<https://www.ioanpioaru.com/post/how-to-make-an-ink-drawing-of-a-house>

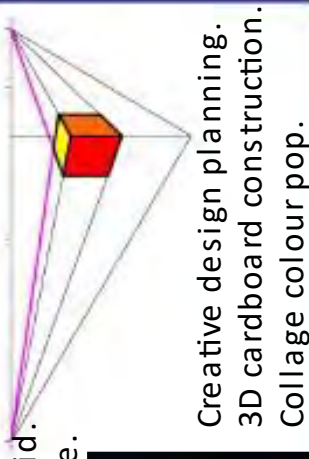
Equipment & Tools

Sketchbooks
 Rulers
 Pencils
 Fine liner/Broad marker
 Scissors and cutting knife
 Cardboard
 Coloured paper
 Pritt Stick



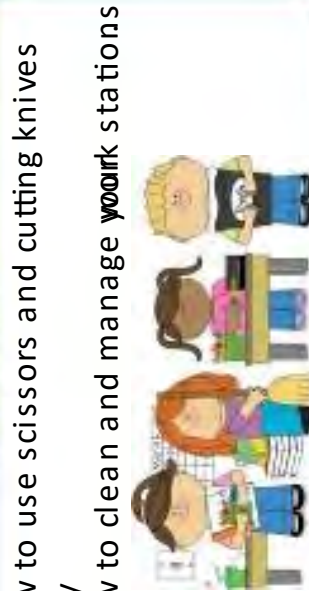
Techniques

Drawing with a grid.
 2 Point perspective.
 Creative design planning.
 3D cardboard construction.
 Collage colour pop.



Health & Safety

Learn how to use scissors and cutting knives effectively
 Learn how to clean and manage your work stations



Further Reading

Research the Shoreditch sketcher <https://www.shoreditchsketcher.com/>
Research Mitchell Johnson <https://www.mitchelljohnson.com/>
Research on Tom Quigley <https://www.creativeboom.com/inspiration/tom-quigley/>
British seaside imagery <https://www.youtube.com/watch?v=C5ASxpddpAQ>

Key Words

Construction
 Perspective
 Line
 Pattern
 Shape
 Form
 Detail
 Mark-making
 Presentation
 Pattern
 Colourpop
 Structure
 Texture

Art: Architectural drawing

Year
8



Key Learning Aims

To learn how to draw using one and two point perspective: To learn how to draw three dimensional form. To learn how to create a mixed media expressive drawing of a building.

Materials & Properties

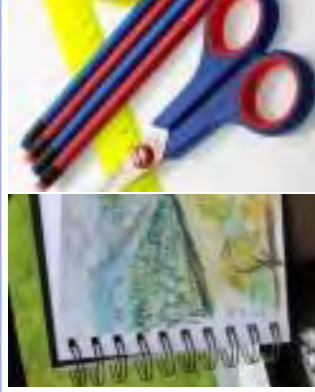
How to draw a building with one point perspective:

How to draw a building with two point perspective:
https://www.youtube.com/watch?v=ZZuY55mqR_Q

How to draw a mixed media building study:
<https://youtu.be/MNaZNyYO7Vw>

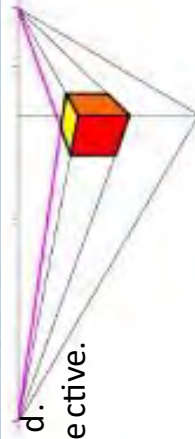
Equipment & Tools

Sketchbooks
Rulers
Pencils
Chalk and charcoal
Scissors
Tissue paper
Pritt Stick



Techniques

Drawing with a grid.
1 and 2 Point perspective.



Mixed media expressive architecture drawing.

Health & Safety

Learn how to use scissors effectively
Learn how to clean and manage work stations



Further Reading

Research Ian Murphy
<https://www.ianmurphyartist.com/about/>

British seaside imagery
<https://www.youtube.com/watch?v=C5ASxpdDpAQ>

Key Words

Construction

Perspective

Line

Pattern

Shape

Detail

Mark-making

Pattern

Structure

Texture

Impasto

Year

8

Art: The Urban relief



Key Learning Aims

To learn how to create art which interacts with the urban space. To learn how to be creative with design and composition. To explore relief, mosaic and textural art. To understand how art can enrich the world around us.

Materials & Properties

Learn additional surface texture techniques:

<https://www.youtube.com/watch?v=NGhn6oWirNQ>

100 creative street sign designs:

<https://www.youtube.com/watch?v=Vzpf4-LJ1ItQ>

How to draw from urban imagery in different ways:

<https://www.youtube.com/watch?v=Rxi65IXgBjo>

How to create like space invader:

<https://www.youtube.com/watch?v=6835HFOf-iY>

Equipment & Tools

Sketchbooks

Rulers

Pencils

Chalk and charcoal

Scissors

Tissue paper

Pritt Stick



Techniques

Mod rock relief

Creative urban drawing

Mosaic art

Surface pattern and shape



Health & Safety

Learn how to use scissors effectively

Learn how to clean and manage work stations



Key Words

Construction

Relief

Urban

Mosaic

Texture

Flat colour

Pixelated

Observation

Conceptual

Pattern

Shape

Composition

Further Reading

Research The Boyle family

<https://www.boylefamily.co.uk/boyle/about/>

Research Space Invader

<https://www.space-invaders.com/home/>

Research Clet Abraham

<https://urbaneez.art/artists/clet-abraham>



Cheat Sheet!

Note Names

Symbol	Rest	Name	Beats
		Semibreve	4
		Minim	2
		Crotchet	1
		Quaver	1/2
		Semiquaver	1/4

DR T SMITH

Dynamics
Rhythm, Tempo and Metre
Texture
Structure
Melody
Instrumentation/Sonority
Tonality
Harmony



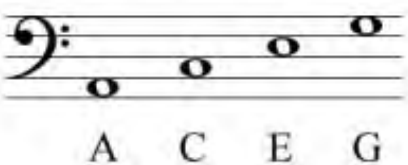
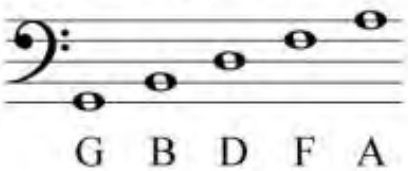
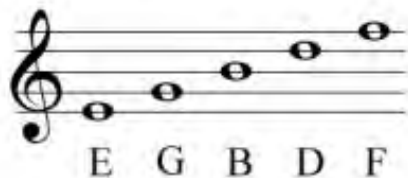
The Piano



C is to the left of the two black keys...



Lines and Spaces



Time Signatures

The top number tells you how many beats there are in a bar

The bottom number tells you what sort of beats they are

2 beats/bar

 Crotchet beat

3 beats/bar

 Crotchet beat

4 beats/bar

 Crotchet beat

You need to know and understand what the DR T SMITH Elements of Music are. Use your keywords lists to help you.

Keyword	Definition
Pitch	How high or low the music is
Tempo	How fast or slow the music is
Rhythm	How long or short the notes are, in relation to the pulse
Melody	The tune
Dynamics	How loud or quiet the music is
Instrumentation	The instruments used in a piece
Timbre	The sound or tone quality of an instrument or voice
Structure	The form/layout of a piece of music
Tonality	The types of harmonies created in a piece, determined by a hierarchy

Then you need to be able to use them in a sentence to describe pieces of music. Some examples are below:

1. The **tempo** of the piece starts **slowly** and gets **faster**
 2. In the piece, the **dynamics** start **loudly** and get **quieter** in the middle
 3. The **instrumentation** in the piece includes **guitars, flutes** and a **piano**
 4. The **rhythm** uses **short note values** and **syncopation**
- The **texture** in the piece starts very **thin**, and **builds** as the piece progresses





Year 8 Drama – Knowledge Organiser

Soliloquy	An act of speaking one's thoughts aloud when by oneself or regardless of any hearers, especially by a character in a play.
In the round	Circular staging in which the acting area, which may be raised or at floor level, is completely surrounded by the audience.
Tone	Adapting your voice from harsh to soft, which reflects the attitude or mood of a character.
Pace	The speed that you deliver your lines / movement.
Pitch	How high or low you make your voice.
Volume	How loud or quiet you say something on stage.
Facial Expressions	Adapting your face to show a specific emotion. The focus is usually on your eyes, eyebrows and mouth.
Body Language	The position of your body to show a clear emotion.
Movement	Where the actors move on the stage, what this communicates to the audience and the effect this has upon the drama.
Gestures	Everyday 'small actions'.
Eye Contact	Establishing eye contact with another actor or the audience.
Proxemics	The proxemics is the distance or level between character/actors shows their relationships and feelings, and give clues of the situation or the people within the situation at that moment.