

Year 7



**Newsome
Academy**
Everyone Exceptional Everyday

Knowledge Organisers

Name:

Team:



Mathematics

Our students will:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The learning outcomes for this topic are:

- Read information from a time series graph
- Describe features of a time series graph
- Use a conversion graph
- Draw a graph from a data table
- Compare two time series graphs
- Create a conversion graph from a conversion rate

Key Word	Definition
Graph	A representation of a sequence of numbers
Coordinate	A point in 2D or 3D space
Axis	The frames of reference for coordinates
Scale	The amount the axes increase by each time
Interpret	Turn a graph into meaningful information, describe trends and patterns and explain their meaning
Extrapolate	Continue a sequence to estimate a value from the pattern
Interpolate	Estimate a value within the data range of the pattern
Describe	Give a detailed account of the shape and features of a graph


Additional Resources

MathsWatch: [A21a](#) , [A21b](#)

Corbett Maths: Videos [151](#) , [152](#) , [171](#) , [171a](#) , [198a](#) ; Worksheets [151/2](#) , [171](#)

Careers Focus – Where could this take you?

Scientists who work for **Government agencies** or **national laboratories** will analyse and interpret the information from graphs to test hypotheses and understand data.



Curriculum Links - Coherence

Required Knowledge:

- 7.09 Graphs of linear equations

Applied to:

- 9F.04 Statistical diagrams
- 11F.03 Distance and velocity time graphs

Links across school:

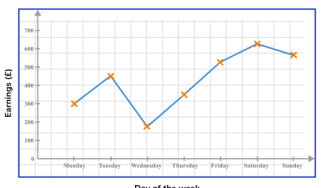
- Interpreting graphs of climate (Geography)
- Interpreting graphs of variables (Science)

Key Concepts

Line Graph

A **line graph** is a way of displaying data to easily see a trend over time.

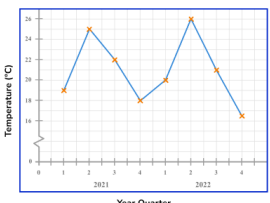
To draw a line graph, we need to **plot individual items** of data onto a set of axes, and then connect each **consecutive data** point with a **line segment**.



The **x-axis** is labelled as time e.g. Day of the week.
The **y-axis** is labelled as the dependent variable e.g. Earnings (£).

Time Series Graphs

A **time series graph** is a line graph that shows data such as measurements, sales or frequencies over time. They can be used to show a pattern or trend in the data and are useful for making predictions about the future such as weather forecasting or financial growth.



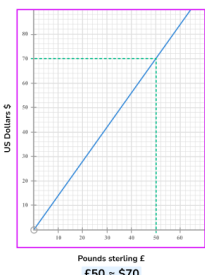
E.g. This **time series graph** shows the temperature of a town recorded over two years at three-monthly periods known as quarters.

The coordinates are plotted and then joined together with **straight line segments**.

Conversion graphs

Conversion graphs are straight line graphs that show a relationship between two units and can be used to convert from one to another. They are very useful to solve real-life problems.

Some **conversion graphs** can show a direct proportion between two units, for example, converting between two currencies to show an exchange rate, such as Pounds Sterling to US Dollars.



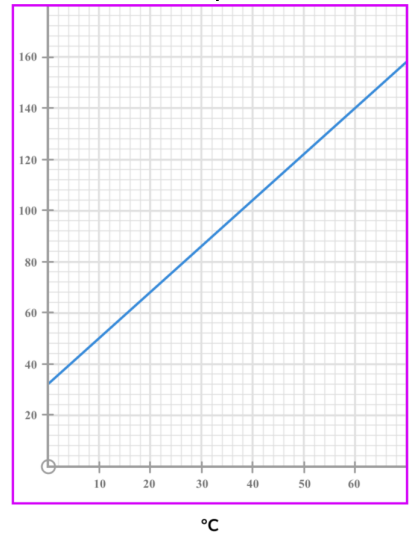
£50 = \$70

Concept – what it is

What is 200 °C in Fahrenheit?

Every increase of 10°C is an increase of 18°F.

So if 0°C = 32°F then

$$200^{\circ}\text{C} = 20 \times 18 + 32 = 360 + 32 = 392^{\circ}\text{F}$$


Non-Concept – what it isn't

20°C is the same as 68°F

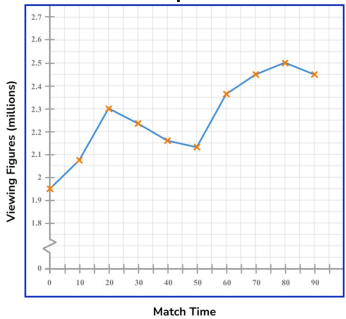
So 200°C = 10 x 68 = 680°F

When using a conversion graph we can only extrapolate the line (make it longer) when it passes through the origin (0,0). If it doesn't, then we **can't** just multiply values to find larger ones

Standard Examples

At what time were the viewing figures the highest?

At what time were the viewing figures the lowest?



Non-Standard Examples

Why might the viewing figures fall from 20 to 50 minutes and then increase from 50 to 80 minutes?

This question is asking us to apply our own experience to suggest a possible reason for this.

Highest at 80 minutes (2.5 million viewers)

Lowest at 0 minutes (1.95 million viewers)

The match might have been boring so people stopped watching. Maybe the match became more exciting, one of the teams may have scored, so people tuned back in.

The learning outcomes for this topic are:

- Read information from a time series graph
- Describe features of a time series graph
- Use a conversion graph
- Draw a graph from a data table
- Compare two time series graphs
- Create a conversion graph from a conversion rate



Useful Formulae and Hints

Check that any graphs don't have the common inconsistencies or misleading features.

- Are the axis **scales consistent** (do the numbers go up by the same amount each time)?
- Does the y-axis **start at zero**?
- Are the values **equally spaced**?

When describing trends remember to talk about

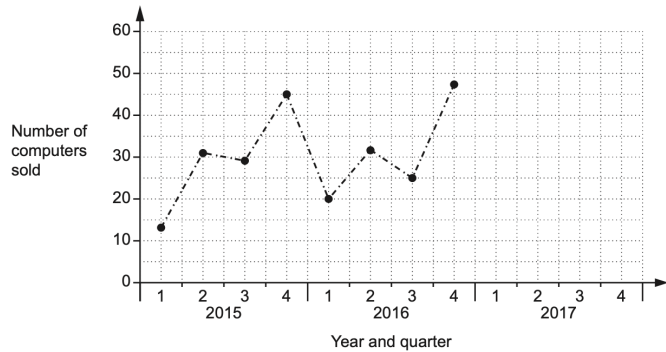
- The **highest** and **lowest** points
- Sections of the graph that are **increasing** or **decreasing**
- Any repeating **patterns**
- Any **peaks** or **troughs**

GCSE Questions

20 The table shows the number of computers sold in Tom's shop each quarter from 2015 to 2017.

	2015				2016				2017			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
Number of computers sold	13	31	29	45	20	32	25	47	27	40	30	58

(a) Complete this graph using the information for 2017.



[2]

(c) Make two comments about Tom's sales over the period 2015 to 2017.

Comment 1

.....

Comment 2

.....

[2]

(d) Tom predicts that he will sell more than 60 computers in the 4th quarter of 2018.

What assumption has he made?

.....

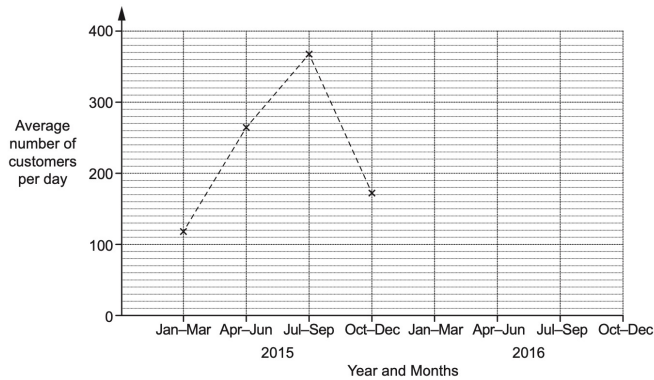
.....

[1]

23 The table shows the average number of customers per day entering a shop.

	2015				2016			
Months	Jan-Mar	Apr-Jun	July-Sep	Oct-Dec	Jan-Mar	Apr-Jun	July-Sep	Oct-Dec
Average number of customers per day	119	264	368	172	130	304	381	192

(a) Complete the time series graph below.



[2]

(b) Make two different comments comparing the number of customers entering the shop in 2015 and 2016.

Comment 1

.....

Comment 2

.....

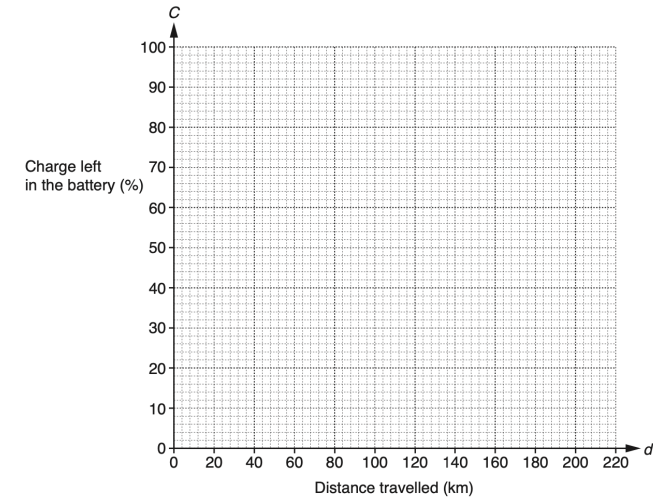
[2]

11 A company tests a new battery for an electric car. The distance the car travels, d km, and the charge left in the battery, C %, are measured.

Some measurements are shown in the table.

Distance travelled, d km.	0	50	100	150
Charge left in the battery, C %.	100	75	50	25

(a) Plot these values on the grid and use them to draw a straight line.



[2]

(b) (i) Use your line to estimate the greatest distance the car will travel.

(b)(i) km [1]

(ii) What assumption is made when estimating the greatest distance?

.....

..... [1]

- Write an addition or subtraction expression from words
- Write a multiplication or division expression from words
- Write a multi-step expression from words

- Write repeated multiplication using powers
- Evaluate simple powers
- Substitute values into simple expressions

Key Word	Definition
Algebra	Where letters are used to represent unknown numbers
Expression	A mathematical rule using numbers and letters which shows a relationship between variables
Formula	A combination of letters and numbers and the four rules + - x ÷
Term	A part of an expression separated by + - x ÷ e.g. 3x, 4kp
Coefficient	The number in front of a letter. E.g. 3x ² The 3 is the coefficient of x.
Power	How many times a number is multiplied by itself. E.g. 2 ³ = 2 x 2 x 2
Index	The power. I.e. the 3 in the above example
Evaluate	Work out the value of
Simplify	Combine like terms together
Substitute	Replace a variable in an expression with a number

Additional Resources
MathsWatch: 95 , 137
Corbett Maths: Videos 16 , 17, 20 , ; Worksheets 16 , 17, 20

Careers Focus – Where could this take you?

As a **computer graphics engineer** I use algebra and Mathematics to write computer programmes for art in films and TV. Things that seem simple, such as waves on an ocean or moving fur on an animal have complex algebraic formulae that bring them to life.

Curriculum Links - Coherence
Required Knowledge: - 7.01 Add and Subtract integers and decimals
Applied to: - 8.16 Setting up and solving equations - 9H.08 Nth term sequences
Links across school: - Interpreting results of experiments(Science)

Key Concepts

Algebraic Expressions

An **algebraic expression** is a set of terms that are combined using addition (+), subtraction (-), multiplication (x) and division (÷)

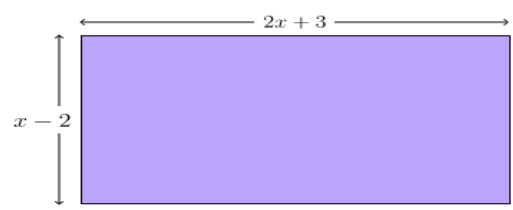
An expression that contains two terms is called a **binomial**.

E.g. $2x + 3y$ or $2 - 5y^2$ etc.

An expression that contains three terms is called a **trinomial**.

E.g. $2x + 3y - 5$ or $2 - 5y^2 + 6xy$ etc.

Example of writing and simplifying algebraic expressions
Write an expression for the perimeter of the shape.



$$\begin{aligned} \text{Perimeter} &= 2x + 3 + x - 2 + 2x + 3 + x - 2 \\ &= 6x + 2 \end{aligned}$$

Index Notation

Index notation is a way of representing numbers (constants) and variables (e.g. x and y) that have been multiplied by themselves a number of times.

E.g.
 $3^4, a^5, 2x^7, (4y^2x^4)^7, z^{-5/2}$

Concept – what it is

Apples cost a pence each
Bananas cost b pence each
Write an expression for the total cost, in pence, of 3 apples and 5 bananas.

$$3a + 5b \text{ pence}$$

Simplify

$$m^5 \times m^3 = m^8$$

Standard Examples

Martin is x years old.
Jennifer is 3 years younger than Martin.
Connor is twice as old as Martin.

Write an expression for the sum of the three ages

$$x + (x - 3) + 2x = 4x - 3$$

Simplify

$$m^8 \div m^2 = m^6$$

Non-Concept – what it isn't

You need to demonstrate that
 $3 + 5$
it is
3 lots of a plus 5 lots of b

You do not multiply the indices.
It is $m \times m \times m \times m \times m$ times
by $m \times m \times m$

Non-Standard Examples

An airplane has economy and first class seating.

There are s seats in each row in economy.
There are t seats in each row in first class.
There are 9 rows in first class and 24 rows in economy.

Write down an expression, in terms of s and t , for the number of seats on the airplane.

$$9t + 24s$$

Simplify

$$(m^3)^2 = m^6$$

7.11 Using algebraic expressions and index notation

The learning outcomes for this topic are:

- Write an addition or subtraction expression from words
- Write a multiplication or division expression from words
- Write a multi-step expression from words

- Write repeated multiplication using powers
- Evaluate simple powers
- Substitute values into simple expressions



Useful Formulae and Hints

Check that all simplifying has been done.

- Have you simplified the same terms?
- Have you got the subtraction the right way round?
- If you are multiplying something, have you remove the times sign?
- Do you need brackets when multiplying something by more than 1 thing?

When writing the powers.

- Have you got the correct number in the index?
- When multiplying powers – add the indices.
- When Dividing powers – subtract the indices.

GCSE Questions

- 2** Charles has m marbles.
Rosalind has 6 more marbles than Charles

Write an expression for the number of marbles Rosalind has.
_____ (1 mark)

- 3** A cup of tea costs $£t$
A cup of coffee costs $£c$

Write an expression, in pounds, for the cost of 5 cups of tea and 4 cups of coffee.
_____ (1 mark)

- 10** Apples costs 30p each.
Write an expression for the cost of a apples.
_____ (1 mark)

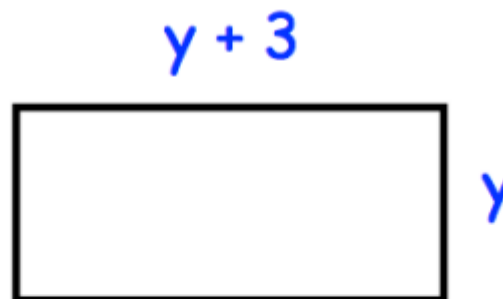
- 15** A child's ticket to see a show costs $£x$
An adult's ticket costs $£5$ more than a child's ticket.

- (a) Write an expression for the price, in pounds, of an adults ticket. (1)
(b) Write an expression for the cost of one adult's ticket and two child's tickets. (2)
_____ (3 marks)

1. (a) Simplify Simplify

$$m^5 \times m^3$$

$$a^6 \div a^3$$



The diagram shows a rectangle. All measurements are in centimetres.

Write an expression, in terms of y , for the perimeter of the rectangle.

An airplane has economy and first class seating.
There are s seats in each row in economy.
There are t seats in each row in first class.

There are 9 rows in first class and 24 rows in economy.

Write down an expression, in terms of s and t , for the number of seats on the airplane.

7.12 Collecting like terms and expanding single brackets

The learning outcomes for this topic are:

- Simplify simple algebraic expressions
- Collect single types of like term
- Collect a mixture of different terms in a single or multiple powers

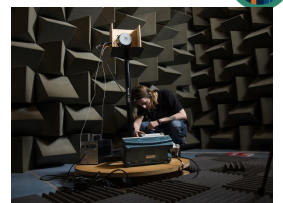
- Expand a numerical term over a single bracket
- Expand a variable term over a single bracket
- Expand a single bracket in context

Key Word	Definition
Like	Similar to. The terms are identical but the coefficients maybe different.
Term	A part of an expression separated by + - x ÷ e.g. 3x, 4kp
Expression	A combination of letters and numbers and the four rules + - x ÷
Bracket	() Usually contains an expression
Coefficient	The number in front of a letter. E.g. 3x ² The 3 is the coefficient of x
Multiplier	What you are multiplying by
Index/Indices	The power. E.g. 2 ³ = 2 x 2 x 2 the 3 is the power
Expand	Make bigger. Remove the brackets by multiplying out
Product	Multiply

Additional Resources
MathsWatch: 33, 34, 35, 93
Corbett Maths: Videos 9, 12; Worksheets 9, 12

Careers Focus – Where could this take you?

As an **acoustic engineer** I need to measure of sound levels.
I use algebra to calculate the noise levels at a concert for example. Considering how large the venue is, the materials in the room and the number of people who will be attending.



Curriculum Links - Coherence
Required Knowledge: - 7.02 Multiplying and Dividing Integers
Applied to: - 8.16 Setting up and solving inequalities - 10H.11 Simultaneous equations
Links across school: - Writing computer programs (Computer Science)

Key Concepts

Collecting like terms

Collecting like terms is a way of simplifying algebraic expressions. It is also known as combining like terms. To do this we identify the like terms in an algebraic expression and combine them by adding or subtracting.

E.g. Collect the like terms $3a + 4b + 2a - 2b$

$3a$ and $+2a$ are like terms
 $+4b$ and $-2b$ are also like terms, but they are different to the terms with the letter a . The plus or minus sign in front of a term belongs to that term.

$$3a + 4b + 2a - 2b = 3a + 2a + 4b - 2b = 5a + 2b$$

Collecting like terms

- In order to simplify algebraic expressions by collecting like terms:
- 1 Identify the like terms
 - 2 Group the like terms
 - 3 Combine the like terms by adding or subtracting

Multiplying out brackets and simplify

'Multiplying out brackets' is another term for expanding brackets. It means exactly the same thing. "Expand the brackets" is the same as "multiply out the brackets", it just gives the additional clue that when we expand brackets, we are multiplying everything outside the brackets by everything inside the brackets.

Concept – what it is	Non-Concept – what it isn't						
<p>Simplify $8c + 2p - 2c + 4p$</p> $\underline{6c + 6p}$ <p>Expand:</p> $2(x + 3)$ <table border="1" style="display: inline-table;"> <tr> <td>×</td> <td>x</td> <td>+ 3</td> </tr> <tr> <td>2</td> <td>2x</td> <td>+ 6</td> </tr> </table> $2(x + 3) = 2x + 6$	×	x	+ 3	2	2x	+ 6	<p>Terms involving y and y^2 are unlike terms and cannot be collected together by adding or subtracting.</p> <p>Careful to do both terms. e.g. Expand $-5x(3x - 4)$</p> <p>It is NOT: $-15x^2 - 4$</p> <p>You need to expand both terms</p> <p>It is NOT: $-15x^2 - 20x$</p> <p>You need to remember the negative sign in front of the $5x$</p>
×	x	+ 3					
2	2x	+ 6					

Standard Examples	Non-Standard Examples
<p>Simplify</p> $20x + 3y - 8y - 7x$ $\underline{13x - 5y}$ <p>Expand $-2(y - 4)$</p> $-2y + 8$ $5y(2y + 1)$ $\underline{10y^2 + 5y}$	$2x + 7$ <div style="border: 1px solid black; width: 100px; height: 30px; display: inline-block;"></div> $x + 3$ $2x + 7 + x + 3$ $+ 2x + 7 + x + 3$ $6x + 20$

7.12 Collecting like terms and expanding single brackets

The learning outcomes for this topic are:

- Simplify simple algebraic expressions
- Collect single types of like term
- Collect a mixture of different terms in a single or multiple powers

- Expand a numerical term over a single bracket
- Expand a variable term over a single bracket
- Expand a single bracket in context



Useful Formulae and Hints

The order of the terms is not critical as long as the plus and minus signs are with the correct term.

It is possible for all the terms to be cancelled out and the answer is zero.

If there is no coefficient (number) seen in front of a term then the coefficient is 1, but we do not write the number 1.

To expand brackets we multiply everything outside of the bracket, by everything inside the bracket.

In order to expand single brackets:
Multiply the term outside of the bracket by the first term inside the bracket.
Multiply the term outside the bracket by the second term inside the bracket.

GCSE Questions

1 Simplify $3x + 4x - 2x$ **(1 mark)**

3 Simplify $n + n + n$ **(1 mark)**

4 (a) Simplify $a \times b \times c$ (1)
 (b) Simplify $5p - 2p$ (1)
 (c) Simplify $\frac{6h}{3}$ (1)

(3 marks)

10 (a) Simplify $f + f + f + f + f$ (1)
 (b) Simplify $5a + 3b + 2a + 2b$ (2)

(3 marks)

19 (a) Simplify $6j \times 5k$ (1)
 (b) Simplify $7a - 6b + 5a + 4b$ (2)

(3 marks)

1. Expand $4(y + 2)$ **2.** Expand $2(3w - 5y)$

3. Expand $3(2y - 1)$ **11.** Expand $-3(y + 2)$

17 (a) Simplify $6f - f$ (1)

(b) Simplify $7x^2 - 3x + 3x^2 + 6x$ (2)

(3 marks)

14 (a) Expand $9x(3y - 8)$ (2)

(b) Expand and Simplify $7(t - 4) + 5(t - 2)$ (2)

(4 marks)

17 (a) Expand $2x^2(4x - 9)$ (2)

(b) Expand and Simplify $6(y + 3) - 5(y - 4)$ (2)

(4 marks)

7.13 Simplifying after factorising single brackets

The learning outcomes for this topic are:

- Expand a bracket and simplify with a single term
- Expand a pair of single brackets and simplify the result
- Factorise a single numerical term out of a single bracket

- Factorise a single variable term out of a single bracket
- Factorise a numerical and variable term (with powers) out of a single bracket
- Find the area of a compound shape that requires the expansion of two separate single brackets

Key Word	Definition
Partial/Partially	Not fully simplified/factorised. A bigger factor exists
Fully	Means there is more than one term to factorise out
Factorise	The opposite of expansion, put the brackets back in
Factor	A number that divides exactly – no remainder
Expand	Multiply out terms with brackets
Simplify	Combine like terms together
Variable	Letters that are used to represent numbers we don't know

Additional Resources
MathsWatch: 93, 94, 134
Corbett Maths: Videos 13, 117; Worksheets 13, 117

Careers Focus – Where could this take you?

An **App developer** needs to calculate how many audio clips can be uploaded to the app before the information on the server needs to be deleted. We use complex Maths when writing apps that will work across multiple devices and platforms.

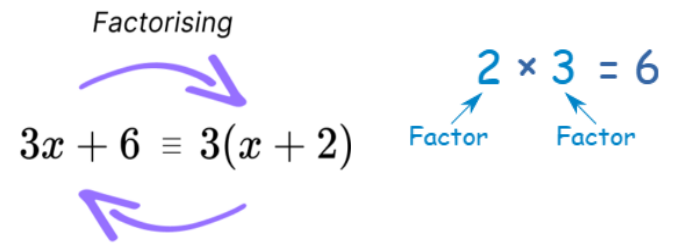
Curriculum Links - Coherence
Required Knowledge: - 7.11 Using algebraic expressions
Applied to: - 9F.17 Quadratic Expansion - 10H.10 Solving Linear equations
Links across school: - Any topic where something is unknown!

Key Concepts

What is factorising

Factorising is the reverse process of expanding brackets. To factorise an expression fully, means to put it in brackets by taking out the highest common factors.

- The simplest way of factorising is:
- Find the highest common factor of each of the terms in the expression.
 - Write the highest common factor (HCF) in front of any brackets
 - Fill in each term in the brackets by multiplying out.



Expand and simplify:

$2x(x + 6) - 3(x - 2)$

×	x	+ 6
2x	2x ²	+ 12x

Multiply the second bracket – remember we are multiplying both x and – 2 by – 3:

×	x	- 2
- 3	- 3x	+ 6

Collect the like terms.
The only like terms are $12x - 3x = 9x$

$$2x(x + 6) - 3(x - 2)$$

$$= 2x^2 + 12x - 3x + 6$$

$$= 2x^2 + 9x + 6$$

Concept – what it is

Example: factor $3y^2 + 12y$

Firstly, 3 and 12 have a common factor of 3.
So we could have: $3y^2 + 12y = 3(y^2 + 4y)$
But we can do better!

$3y^2$ and $12y$ also share the variable y .
Together that makes $3y$:

- $3y^2$ is $3y \times y$
- $12y$ is $3y \times 4$

So we can factor the whole expression into:

$$3y^2 + 12y = 3y(y + 4)$$

Non-Concept – what it isn't

It is not trying to add $3x + 6$ and ending up with $9x$. You have 3 times something we don't know plus 6.

It is NOT:
 $3x + 6 = 3(x + 6)$ factorise BOTH terms.

Factorise completely

$$24x^2 + 20x$$

$$4(6x^2 + 5x)$$

Note: there is a x which could also be factorised.

Standard Examples

Factorise fully

$$24x^2 + 20x$$

$$4x(6x + 5)$$

Factorise fully

$$6x^3 + 8x^2y$$

$$2x^2(3x + 4y)$$

Non-Standard Examples

Factorise

$$21x + 35v - 14z$$

$$7(3x + 5v - 2z)$$

Factorise completely

$$8ap + 12cp - 4p^2$$

$$4p(2a + 3c - p)$$

7.13 Simplifying after factorising

single brackets

- The learning outcomes for this topic are:**
- Expand a bracket and simplify with a single term
 - Expand a pair of single brackets and simplify the result
 - Factorise a single numerical term out of a single bracket

- Factorise a single variable term out of a single bracket
- Factorise a numerical and variable term (with powers) out of a single bracket
- Find the area of a compound shape that requires the expansion of two separate single brackets



Useful Formulae and Hints

Check your positive and negative signs are correct

If you expanded your answer, would you get the answer you started with?

Are you sure there is nothing extra you can take out?

e.g. $12x - 18$
 $3(4x - 6)$

There is still a factor of two which could come out.

$6(2x - 3)$

Does it say factorise fully? This means you need to take out more than one letter/number.

Have you done both sides?

GCSE Questions

- 1** (a) Expand $7(2x + 7)$ (1)
(b) Factorise $3y + 12$ (1)
(2 marks)

- 4** (a) Expand $8(3s - 2)$ (1)
(b) Factorise $4t + 20$ (1)
(2 marks)

- 9** (a) Factorise $x^2 - 9x$ (1)
(b) Expand $6(5y + 1)$ (1)
(2 marks)

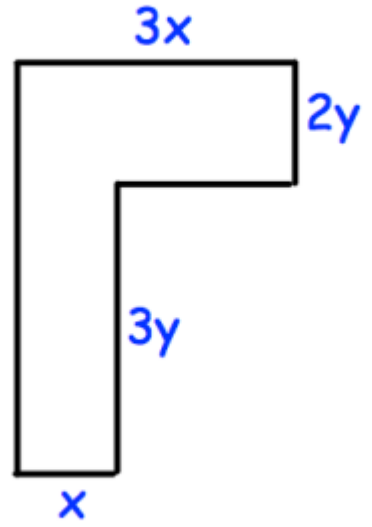
- 13** (a) Expand $a(a + b)$ (1)
(b) Factorise $15y - 6$ (1)
(2 marks)

- 14** (a) Expand $9x(3y - 8)$ (2)
(b) Expand and Simplify $7(t - 4) + 5(t - 2)$ (2)
(4 marks)

- 17** (a) Expand $2x^2(4x - 9)$ (2)
(b) Expand and Simplify $6(y + 3) - 5(y - 4)$ (2)
(4 marks)

Question 1: Explain why $8x + 3y$ cannot be factorised.

13. Shown is an L shape.



All measurements are in centimetres.
Find an expression for the area of the L shape.

7.14 Substitution, using and writing formulae

- The learning outcomes for this topic are**
- Substitute positive integers into simple linear expressions
 - Substitute negative integers or decimals into simple linear expressions
 - Describe a simple formulae in terms of a function

- Substitute negatives and decimals into expressions with squares
- Write formulae for simple functions or worded descriptions
- Create a formula to then substitute values into worded descriptions

Key Word	Definition
Substitute	Replace a variable in an expression with a number
Integer	A whole number. Can be positive or negative
Value	How much it is
Evaluate	Work out the value
Formula(e)	A mathematical rule using numbers and letters which shows a relationship between variables
Expression	A combination of letters and numbers and the four rules + - x ÷
Linear Term	A part of an expression separated by + - x ÷ e.g. 3x, 4kp
Substitute	Replace a variable in an expression with a number

Additional Resources
MathsWatch: 95, 137
Corbett Maths: Videos 20, 115; Worksheets 20, 115

Careers Focus – Where could this take you?

I am an anaesthiologist and it is my job to administer anaesthesia to patients who are having surgery. This could be local anaesthetic that just numbs a part of the body or general anaesthetic that puts the patient to sleep. It is important that I am able to use the formulae correctly and substitute numbers such as age, weight or height to accurately calculate the medication needed for the patient to be safe.

Curriculum Links - Coherence
Required Knowledge: - 7.11 Basic algebra
Applied to: - 9H.09 Linear sequences - 9H.22 Changing the subject
Links across school: - Forecasting for different outcomes (Business) - Changing amounts of variables in an experiment (Science)

Key Concepts

Substitution

Substitution means replacing the variables in an algebraic expression with numerical or algebraic values.

E.g.
Find the value of $3b + 4$ when $b = 10$

$$3b \text{ means } 3 \times b = 3 \times 10 = 30$$

$$\text{So } 3b + 4 = 30 + 4 = 34$$

Substitution

In order to substitute into an algebraic expression:

- 1 Rewrite the expression substituting each variable with its given value.
- 2 Calculate the total value of the expression. Remember that you must apply BIDMAS.

Speed is calculated using the formula

$$S = \frac{D}{T}$$

where D is distance and T is time.

$$\text{Here } D = 100 \text{ and } T = 2$$

Substituting into the formula:

$$S = \frac{100}{2}$$

Work it out:

$$S = 50\text{mph}$$

Find the speed at which a car travelled if it took 2 hours to travel a distance of 100 miles.

Concept – what it is

Find the value of $3x - 5y$ when $x = 5$ and $y = 4$.

1 x is 5 and y is 4 so

$$3 \times 5 - 5 \times 4$$

2 Work out the value of the expression:

$$3 \times 5 - 5 \times 4 = 15 - 20 = -5$$

Non-Concept – what it isn't

The meaning of ab
Remember in algebraic expressions, ab means a multiplied by b , not the number b written after the number a . So if $a = 3$ and $b = 5$, $ab = 3 \times 5$, not 35.

Not applying Order of Operations
The rules need to be followed here as in normal numerical calculations.

Mistakes with negative numbers
The most common mistake is thinking that a negative number squared gives a negative answer. Remember that squared means multiplied by itself

Standard Examples

Find the value of $5z^2 + 7y$ when $z = -10$ and $y = -3$.

1 Substituting z for -10 and y for -3 :

2 Work out the value of the expression:

$$5 \times (-10)^2 + 7 \times -3 = 5 \times 100 + 7 \times -3 = 500 + -21 = 479$$

Non-Standard Examples

The amount of medicine, s ml, to give to a child can be worked out using the formula.

$$s = \frac{am}{150}$$

s is the amount of medicine, in ml.
 a is the adult dose, in ml.
 m is the age of the child, in months.

A child is 20 months old. An adult's dose is 45ml. Work out the amount of medicine the child should be given.

$$s = \frac{45 \times 20}{150} = \frac{900}{150}$$

6ml

7.14 Substitution, using and writing formulae

The learning outcomes for this topic are:

- Substitute positive integers into simple linear expressions
- Substitute negative integers or decimals into simple linear expressions
- Describe a simple formulae in terms of a function

- Substitute negatives and decimals into expressions with squares
- Write formulae for simple functions or worded descriptions
- Create a formula to then substitute values into worded descriptions



Useful Formulae and Hints

In Algebra "Substitution" means putting numbers where the letters are.

When substituting negative numbers we need to be particularly careful and remember the rules for operations with negatives. It is best to put () around them so we get the calculations right.

Another important point to remember is that squared means multiplied by itself.

Think of it as swapping the algebra for numbers.

Careful you do the correct maths 4g when g = 6 is 4 times 6 = 24.

GCSE Questions

1 $f = 7$
 $g = 5$
Work out the value of $3f + 2g$ **(2 marks)**

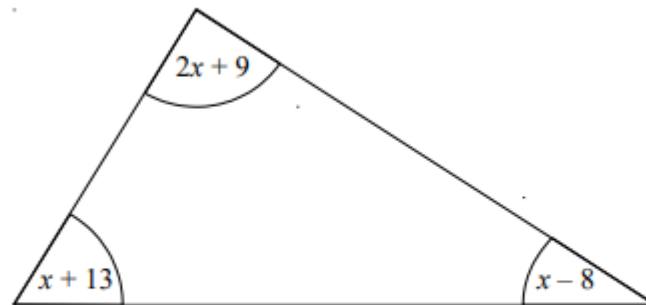
6 $q = 5p + 3r$
 $p = 6$
 $r = -4$
Work out the value of q . **(2 marks)**

10 $q = 6p - r$
 $p = -4$ and $r = 5$
Work out the value of q . **(2 marks)**

14 $a = 5bc$
 $b = -4$ and $c = -3$
Work out the value of a . **(2 marks)**

20 $w = 5x^2 + 3$
 $x = -3$
Work out the value of w . **(2 marks)**

5 The sizes of the angles, in degrees, of a triangle are $2x + 9$, $x + 13$ and $x - 8$



Work out the value of x .

(Total for question 5 is 3 marks)

25 $s = ut + \frac{1}{2}at^2$
 $u = 3$, $a = 2$ and $t = 4$
Work out the value of s . **(2 marks)**

The learning outcomes for this topic are:


- Write a decimal as a percentage
- Write a percentage as a decimal
- Write a percentage as a fraction
- Write a decimal as a fraction
- Write a quantity as a fraction of another
- Write a fraction as a decimal

Key Word	Definition
Fraction	A part of a whole that has been divided into equal amounts. It describes how many parts you are talking about
Decimal	Part of a number expressed as divisions by the power of 10s
Percentage	Literally for every hundred. A fraction expressed as a proportion of 100
Conversion	Change from one unit to another
Equivalence	Two fractions that have the same value, with different numbers for the numerator and denominator
Quantity	How many or how much of something you have
Proportion	A relationship which maintains a constant ratio. Part of a whole.

Additional Resources
MathsWatch: 85
Corbett Maths: Videos 121 - 131 Worksheets 121 - 131

Careers Focus – Where could this take you?

As a government analysts I use fractions, decimals and percentages. I will look at population data to discover what the makeup of the population is and then will use this information to influence and determine policy.



Curriculum Links - Coherence
Required Knowledge: - KS2 place value
Applied to: - 8.03/4/5 +- x ÷ fractions - 10H.15 Limits of accuracy
Links across school: - Recipes (Food and Nutrition)

Key Concepts

What are fractions, decimals and percentages?

Fractions, decimals and percentages are different ways of representing a proportion of the same amount.

There is equivalence between fractions, decimals and percentages.

E.g.
 $\frac{43}{100} = 0.43 = 43\%$

Comparing Fractions, Decimals and Percentages

Fractions, decimals and percentages are different ways of expressing the same value.

E.g.
 $\frac{1}{2} = 0.5 = 50\%$



A Half can be written...

- ... as a fraction: $\frac{1}{2}$
- ... as a decimal: 0.5
- ... as a percentage: 50%



A Quarter can be written...

- ... as a fraction: $\frac{1}{4}$
- ... as a decimal: 0.25
- ... as a percentage: 25%

[Decimals, Fractions and Percentages \(mathsisfun.com\)](http://mathsisfun.com)

Concept – what it is

To convert from a decimal to a percentage we multiply by 100

$$0.7 \times 100 = 70$$

$$0.7 = 70\%$$

To convert from a decimal to a fraction, Which column is the furthest right number in, then put that under the decimal.

E.g. 0.88, The right hand 8 is in the hundredths column.

$$\frac{88}{100} = \frac{22}{25}$$

Convert $\frac{7}{12}$ to a decimal.

$$\frac{7}{12} = 0.58\bar{3}$$

We need to calculate $7 \div 12$

Convert $\frac{7}{20}$ to a percentage.

To convert the fraction to a percentage we need to make the denominator 100.
We can make the denominator 100 by multiplying by 5.
 $20 \times 5 = 100$
We have to multiply the numerator by 5 too keep the fraction equivalent.
 $7 \times 5 = 35$

Non-Concept – what it isn't

Often 7% is confused for 0.7.
Remember per cent literally means for every hundred. So 7 out of a hundred. Or 7 hundredths.

123% is NOT 0.123. 100% is a whole. It is all of something so translates to 1.
123% = 1.23.

12½% is NOT 12.5. It is also NOT 1.25.
12½ is one eighth of a hundred. 1/8 as a decimal is 0.125.

In the same way 0.145 is NOT 145/100 NOR is it 145%. The 5 is in the thousandth column so 145/1000

Standard Examples

Fraction	Decimal	Percent
1/2	0.5	50%
1/3	0.333...	33.333...%
2/3	0.666...	66.666...%
1/4	0.25	25%
3/4	0.75	75%
1/5	0.2	20%
2/5	0.4	40%
3/5	0.6	60%
4/5	0.8	80%
1/6	0.1666...	16.666...%
5/6	0.8333...	83.333...%
1/8	0.125	12.5%
3/8	0.375	37.5%
5/8	0.625	62.5%
7/8	0.875	87.5%

Non-Standard Examples

125%	1.25	$\frac{5}{4}$
150%	1.5	$\frac{3}{2}$
200%	2	

$$3\frac{5}{8} = 3.625 = 362.5\%$$

The learning outcomes for this topic are:

- Write a decimal as a percentage
- Write a percentage as a decimal
- Write a percentage as a fraction

- Write a decimal as a fraction
- Write a quantity as a fraction of another
- Write a fraction as a decimal



Useful Formulae and Hints

Look at the last column of the decimal.

0.7 is the tenths = $\frac{7}{10}$
0.07 is hundredths = $\frac{7}{100}$
0.007 is thousandths $\frac{7}{1000}$

Percentages are out of a hundred. You can have an improper fraction (top heavy).

Fractions are calculated by equivalent fractions.

$\frac{1}{5} = \frac{20}{100} = 20\% = 0.2$
What do you need to multiply (times) 5 by to get to a hundred? (20!)
In order to keep the proportion of the fraction the same you need to multiply the numerator (top) by the same.

When ordering numbers put them all into the same format. Either decimals (my favourite) or percentages.

Remember to use the original numbers in your answer.

GCSE Questions

- 1** Write 0.29 as a percentage. **(1 mark)**
-
- 2** Write $\frac{5}{100}$ as a decimal. **(1 mark)**
-
- 4** Write 18% as a decimal. **(1 mark)**
-
- 6** Write 0.3 as a fraction. **(1 mark)**
-
- 7** Write $\frac{2}{5}$ as a decimal. **(1 mark)**
-
- 13** Write $\frac{3}{50}$ as a percentage. **(1 mark)**
-
- 14** Write 0.06 as a percentage. **(1 mark)**
-
- 15** Write 0.11 as a fraction. **(1 mark)**
-


- 25** Dean says that 13% is greater than 0.1
- Is Dean correct?
Give a reason for your answer. **(1 mark)**
-
- 26** Tom and Jerry both earn the same monthly salary.
- Each month:
Tom saves 35% of his salary.
Jerry spends $\frac{3}{5}$ of his salary and saves the rest of his salary.
- Work out who saves the most money each month.
You must show your working. **(2 marks)**
-
- 28** Write the following numbers in order of size.
Start with the smallest number.
- 0.3 $\frac{1}{3}$ 21% $\frac{1}{4}$ 0.205
- (2 marks)**
-

Our students will:

- read easily, fluently and with good understanding
- develop the habit of reading widely and often, for both pleasure and information
- acquire a wide vocabulary, an understanding of grammar and knowledge of linguistic conventions for reading, writing and spoken language
- appreciate our rich and varied literary heritage
- write clearly, accurately and coherently, adapting their language and style in and for a range of contexts, purposes and audiences
- use discussion in order to learn; they should be able to elaborate and explain clearly their understanding and ideas
- are competent in the arts of speaking and listening, making formal presentations, demonstrating to others and participating in debate.



Keyword 	Definition
Ballad	Poems that tell a story
Blank verse	Poems that don't rhyme, usually ten syllables
Sonnet	14 lined love poem
Epic	Heroic story poem
Haiku	3 line poem, syllables 5/7/5, usually about nature
Rhyming couplet	Two lines next to each other that rhyme
Free verse	No regular rhyme or rhythm
Alliteration	When words placed together start with the same sound
Metaphor	When one thing is said to be another but it can't be literally true
Simile	Comparison using 'like' or 'as'
Personification	Giving an object a human quality
Caesura	A pause in the middle of a line
Enjambment	When one line or stanza runs into the next one without a pause.



Key Concepts

What is poetry?

Poetry is a type of literature, or artistic writing, that attempts to stir a reader's imagination or emotions.

The **poet** does this by carefully choosing and arranging language for its **meaning**, sound, and rhythm.

Poetry usually looks different to prose, (for example a novel). Poems are usually shorter and try to explore an idea by choosing words and phrases very carefully for effect – but this can mean that the reader needs to consider different possible meanings when thinking about the message of the poem.

What is conflict?

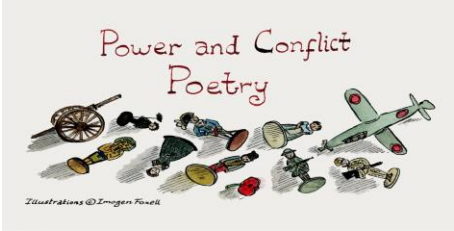
A **conflict** is a struggle between people which may be physical, or between **conflicting** ideas.

The word comes from Latin 'conflingere.' 'Conflingere' **means** to come together for a battle.

Conflicts can either be within one person, or they can involve several people or groups.

Examples of conflict:

- War
- Conflict within a family or relationship
- Conflict between your country of birth and the country you now live in
- Conflict with the ideas of your country's government




Some of the poets on this scheme of work:

Wilfred Owen – World War 1 poet who felt strongly about the huge loss of life and the conditions of the soldiers.

Moniza Alvi/Sujatta Bhat - Two poets who explore the challenges of moving from one country/culture to another one.

Alfred Tennyson – A 19th Century poet who wrote about the heroic actions of the British cavalry, but also about the mistakes made by their superiors.

Retrieval Practice 	
Questions	Answers
What is a 'stanza'?	A division of a poem consisting of a series of lines arranged together in a usually recurring pattern of meter and rhyme
What is 'blank verse'?	Poems that don't rhyme, usually ten syllables
Which war was Wilfred Owen known for writing about?	The First World War
What is a simile?	A comparison using 'like' or 'as'
What is a rhyme scheme represented by?	Letters, for example ABBA, AABB, ABAB
What is the technical name for a four-line stanza?	A quatrain
What is rhythm?	The beat of a poem
What is the form of a poem?	The shape of a poem on the page including lines and stanzas
<p>Explain how the following quotation links to conflict:</p> <p>'And if you lived in a place you had to speak a foreign tongue, your mother tongue would rot, rot and die in your mouth until you had to spit it out.'</p>	<p>The poet is explaining her own conflicting ideas regarding language by comparing her original language or 'mother tongue' to a neglected plant. She is cultivating her 'foreign tongue' and letting her 'mother tongue' 'rot'. The plant metaphor implies that the poet has conflicting emotions about replacing her first language with a more often used second language.</p>

Career Focus - Where could this take you?



As a librarian, you'll be involved in the categorisation and promotion of various works of fiction and non-fiction. You will be able to work in various locations including: museums, schools, public/ council run libraries and universities.

Challenge Activities

- 1) Research one or more of the poets in the key concepts section and design a fact file on them to understand their context.
- 2) Read Sujatta Bhatt's poem: 'Search for my Tongue' and write an analysis of what her message is or discuss the message using Voice 21 skills.
- 3) Write a poem in any form you like about a topic you feel passionate about and want to send a message to all your readers about (you may like to enter a recording of you reciting it).

Topic Links

This topic links to:

- History: WW1/how conflicts have changed
- British Values
- RE: Attitudes to war and death

Additional Resources

To further practise and develop your knowledge see:

- Sujatta Bhatt's: '[Search for my Tongue](#)'
- Language, structure and form click [here](#)
- Charge of the Light Brigade [here](#)
- How to write a poem [here](#)

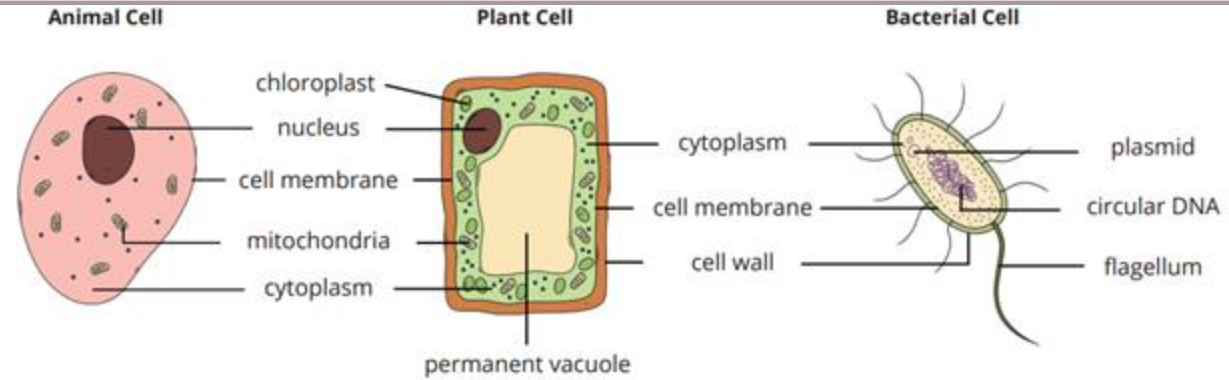


Our students will:

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics
- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

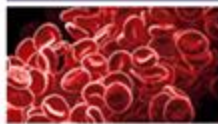
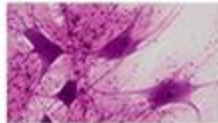
Keywords	Definition
Cell	Basic unit of life.
Cell membrane	Controls the movement of substances in and out of the cell.
Nucleus	Contains genetic information.
Circular DNA	The genetic information found inside bacteria (without nucleus).
Cell wall	Provides support to plant and bacterial cells.
Cytoplasm	Jelly-like substance where chemical reactions take place.
Mitochondria	Where respirations takes place. Releases energy.
Chloroplasts	Contains the green pigment chlorophyll, the site of photosynthesis.
Vacuole	Contains cell sap.
Flagella	Hairlike structure that allows bacteria to move.
Plasmid	Small circular ring of DNA.
Specialised cell	Cells designed to carry out a particular role in the body.
Function	The purpose for which something exists, its role.
Adaptation	Features of living organisms that help them survive

Key Concepts

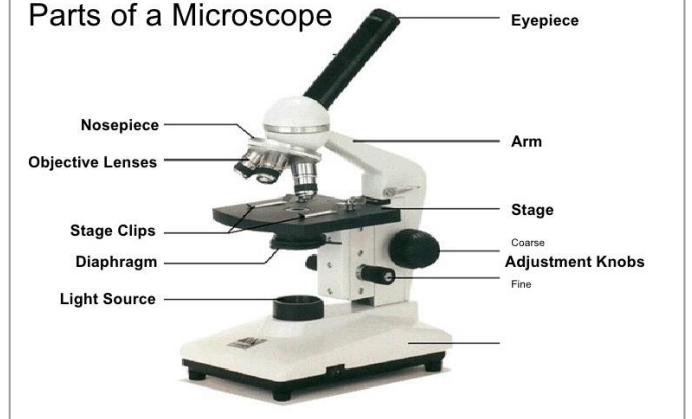


Specialised Cells

Humans are multicellular. That means we are made of lots of cells, not just one cell. The cells in many multicellular animals and plants are specialised, so that they can share out the processes of life. They work together like a team to support the different processes in an organism.

Image	Type of animal cell	Function	Special features
	Red blood cells	To carry oxygen	<ul style="list-style-type: none"> Large surface area, for oxygen to pass through Contains haemoglobin, which joins with oxygen Contains no nucleus
	Nerve cells	To carry nerve impulses to different parts of the body	<ul style="list-style-type: none"> Long Connections at each end Can carry electrical signals

Parts of a light microscope




- Using a Light microscope
- Prepare a slide.
 - Plug in microscope and turn on light.
 - Place slide on stage and hold with clips.
 - Use lowest magnification objective lens to focus image.
 - Then turn up the magnification by turning to a higher power objective lens.

Retrieval Practice

Questions	Answers
What is a cell?	Cells are the basic building blocks of all living organisms.
What is an organelle?	Specialised structures that perform various jobs inside cells.
What is the function of the nucleus?	Contains genetic information (DNA) that controls cell activities.
What is the function of the cell membrane?	To control what enters and leaves the cell.
What is the function of the cytoplasm?	Where chemical reactions take place.
What is the function of mitochondria?	The site of respiration - where energy is released.
What is the function of the cell wall?	To strengthen and support plant and bacterial cells.
What is the function of chloroplasts?	Contains chlorophyll to absorb light energy for photosynthesis.
Which organelles are present in both animal and plant cells?	Nucleus, Cell membrane, Cytoplasm, Mitochondria,
Which organelles are present in plant cells but not in animal cells?	Chloroplasts, Cell wall, Vacuole.
Name the parts of a microscope	Eye piece, objective lens, stage, lamp, focusing wheel.
What does focus mean and how do you focus an image?	Making an image clear enough to be viewed under the microscope by using the focussing wheel.
What is a specialised cell?	Specialised cells are cells designed to carry out roles in the body.

Career Focus - Where could this take you?



I am a biochemist. My job is to investigate the chemical processes that take place in all living things such as bacteria, plants and people. My workplace is a laboratory at a University where I get to plan and carrying out scientific experiments, use lab equipment and publish my findings. Biochemistry has hugely benefited society, for example it has provided explanations for many diseases, helped with food production and improved human health!

Challenge Activities

1. Make flashcards for the definitions and retrieval practice questions.
2. Make a mindmap for this topic. Remember to include keywords and the links between information.
3. Research specialised cells found in both animals and plants and turn the information into a leaflet.
4. Make a 3D model of a cell - you can use recycled materials or even bake!
5. Find out more about Biochemists and what they do. What qualifications would you need for this career? What current research is being done?
6. Construct a fact file about a famous historical scientist that helped us to understand more about cells

Topic Links

This topic links to other science topics such as

- Scientific Skills
- Organisation
- Energy

We will also be practising how to

- Calculate area and volume
- Write descriptively to compare cells

Additional Resources

Educake - <https://www.educake.co.uk/>
 BBC Bitesize - <https://www.bbc.co.uk/bitesize/guides/z9hyvcw/revision/3>
 YouTube Cognito - <https://www.youtube.com/watch?v=qHkUOIC8Nbo&list=PLidqqIGKox7X5UFT-expKluR-i-BN3Q1g&index=2>

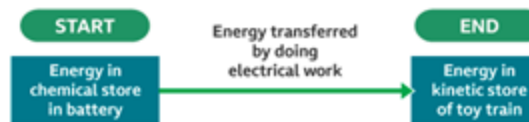
- to understand how energy is stored and transferred
- to be able to calculate energy efficiency

- to understand the different types of energy resources
- to be able to identify the different between renewable and non-renewable energy sources

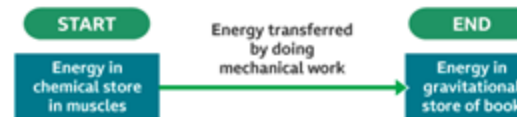
Keyword	Definition
Energy store	Type of energy. Energy is measured in Joules (J).
Kinetic energy	Anything moving has energy in its kinetic store (faster = more energy).
Gravitational potential energy	Anything that has mass and is in a gravitational field (higher up = more energy).
Chemical energy	Anything that can release energy by a chemical reaction (examples include food and fuels).
Elastic potential energy	Anything that can be stretched or compressed.
Thermal energy	Every object has thermal energy (higher temperature = more energy).
Energy transfer	When energy moves from one store to another.
Heat transfer	Energy transfer between hot and cold objects.
Electrical transfer	Energy transfer when a charge (current) moves.
Radiation transfer	Energy transfer through light/sound.
Mechanical transfer	Energy transfer when an object moves due to a force.
Renewable	Naturally replenished (will not run out), for example solar panels and wind turbines.
Non-renewable	Not naturally replenished (will run out), for example fossil fuels.

Energy transfers

Example 1: Battery powered train



Example 2: Person moving a book to a high shelf



Law of Conservation of Energy

The law of conservation of energy states that energy **cannot** be **created** or **destroyed**, it can **only** be **transferred** from one store to another.

When energy is transferred, it can be **dissipated**. This is where energy is '**wasted**' by being transferred to the **surroundings**. Energy becomes stored in less useful ways, e.g. as thermal energy.

Energy efficiency

How good a device is at transferring energy input to useful energy output is called **efficiency**. The more efficient a device is, the less energy it will waste.

$$\text{EFFICIENCY} = \frac{\text{USEFUL POWER OUTPUT}}{\text{TOTAL POWER INPUT}} \times 100$$

Energy resources

FOSSIL FUELS (NON-RENEWABLE)

Coal, oil and gas are all fossil fuels. They are formed from dead remains over millions of years. They are burnt which produces thermal energy used to turn a generator and make electricity.



- + Reliable
- + Releases energy quickly
- + Can be used in vehicles as fuel

- Will run out
- Releases carbon dioxide
- Extraction can run landscapes

SOLAR PANELS (RENEWABLE)

They use the sunlight to produce an electrical current.



- + No pollution
- + No fuel costs
- + Can be used in remote locations

- Unreliable
- Expensive to set up
- Can only be used in daytime

WIND TURBINES (RENEWABLE)

Wind turns the blades which turns a generator, this produces electricity.



- + No pollution
- + No fuel costs
- + Minimal running costs

- Unreliable
- Spoils the view
- Can only be used when it is windy



- to understand how energy is stored and transferred
- to be able to calculate energy efficiency

- to be able to identify the different types between renewable and non-renewable energy sources

Retrieval Practice



Questions	Answers
What is kinetic energy?	Anything moving has energy in its kinetic store (faster = more energy).
What is thermal energy?	Every object has thermal energy (higher temperature = more energy).
What is elastic potential energy?	Anything that can be stretched or compressed.
What is gravitational potential energy?	Anything that has mass and is in a gravitational field (higher up = more energy).
What is chemical energy?	Anything that can release energy by a chemical reaction (examples include food and fuels).
What are the 4 methods of energy transfer?	Heat, electrical, radiation, mechanical.
What is unit of measurement for energy?	Joules (J).
What is the law of conservation of energy?	Energy cannot be created or destroyed; it can only be transferred from one store to another.
What does the efficiency tell you about a device?	How much of the input energy is transferred usefully and how much is wasted.
What does renewable mean?	It is naturally replenished (will not run out).
What does non-renewable mean?	It is not naturally replenished (will run out).
What are the disadvantages of using fossil fuels?	It is non-renewable so will run out, it releases carbon dioxide and extraction can ruin landscapes.
What are the advantages of solar panels?	It is renewable so will not run out, there is no pollution or fuel costs and has minimal running costs.

Career Focus - Where could this take you?



I am a welder. My job is to use high heat to fuse materials, creating strong, durable bonds between them. I must decide the best techniques to use on different materials to quickly create strong and safe joins. Welders are required in most sectors so my workplace could be in a workshop, in a factory, on a construction site, on a demolition site or even on an oil rig. Welding combines the mental satisfaction of exacting technical standards with the physical rewards of precise handcrafting.

Challenge Activities



1. Make flashcards for the definitions and retrieval practice questions.
2. Make a mind map for this topic. Remember to include keywords and the links between information.
3. Research the latest innovations in renewable energy. What is currently being developed and how does it work?
4. Make a poster about energy transfers.
5. Find out more about welders and what they do. What qualifications would you need for this career? What is the average salary?
6. Research the famous scientist Thomas Edison (1847-1931) and how he influenced and improved our understanding of energy. What contributions to society did he make?

Topic Links



This topic links to other science topics such as:

- Digestive system
- Types of pollution

We will also be learning how to create a sustainable future and economy.

Additional Resources






Educake - <https://www.educake.co.uk/>

BBC Bitesize - <https://www.bbc.co.uk/bitesize/topics/z89ddxs>

YouTube Cognito - <https://www.youtube.com/watch?v=JGwDCeYRYo&list=PLidqqIGKox7UVC-8WC9djoeBzwxPeXph7>

Keyword	Definition
Solid	Solid objects can hold their shape.
Liquid	Liquids can flow but cannot be compressed (squashed).
Gas	Gases can flow and expand to fill a container.
State of Matter	The states at which substances can exist, either solid, liquid or gas.
Particles	A small portion of matter usually drawn as a circle.
Properties	The characteristics of a substance.
Melt	When a substance changes from a solid to a liquid.
Freeze	When a substance changes from a liquid to a solid.
Condense	When a substance changes from a gas to a liquid.
Evaporate	When a substance changes from a liquid to a gas.
Diffuse	When particles of a substance spread out.
Filtration	Separating insoluble solid from liquid.
Distillation	Separating a solvent from a mixture.
Chromatography	Separating a mixture of soluble substances.

Key Concepts

	Solid	Liquid	Gas
particle model diagram			
particle arrangement	regular structure no space between particles	irregular structure very little space between particles	irregular structure large space between particles
volume and shape	fixed volume fixed shape	fixed volume shape changes to fill bottom of container	volume increases to fill capacity shape changes to fill capacity
able to flow	no (forces between particles are very strong and hold them in fixed positions)	yes (forces between particles are weak and particles slide over one another)	yes (forces between particles are very weak and particles move randomly and rapidly)
density	high cannot be compressed (particles are already tightly packed)	high cannot be compressed (particles are already tightly packed)	low can be compressed (particles are forced closer together)
particle energy levels	low (particles vibrate around a fixed point only)	moderate (particles can move and flow but slowly)	high (particles moving rapidly and freely)

Filtration and Crystallisation



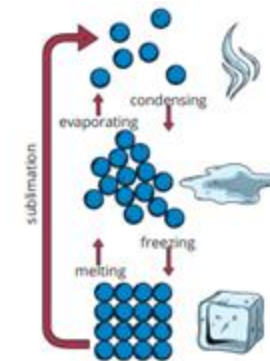
Filtration can be used to separate an insoluble solid from a liquid by passing the mixture through a funnel and filter paper. The solid residue remains in the paper and the liquid is called the filtrate. For example separating sand and water.

Evaporation can be used to separate a soluble solid from a liquid by heating the solution and allowing the liquid to evaporate. The soluble solid will be left behind and will crystallise. For example separating salt and water.



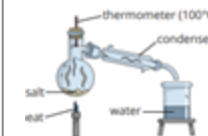
Changes of State

Substances can change state; from a solid to a liquid (melting) liquid to a gas (evaporating) gas to liquid (condensing) and liquid to solid (freezing). Sublimation is when a substance changes from a solid directly to a gas.



The arrangement of particles changes when the substance changes state.

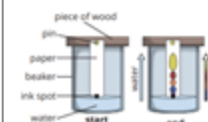
Distillation



Distillation can be used to separate a solvent from a solution. The liquid is heated and evaporates from the flask and into the condenser where it turns back into a liquid.

Distillation is used to either collect a liquid or separate 2 liquids with different boiling points. E.g. collect pure water from salt water or separating water and ink.

Chromatography



Chromatography can be used to separate a mixture of soluble substances. For example different dyes in inks.

The colours are separated because they have varying solubilities.

The inks are carried up the filter paper (stationary phase) by a solvent (the mobile phase).



Retrieval Practice



Questions	Answers
How are particles arranged in solids?	A regular structure with no space between particles
How are particles arranged in liquids?	An irregular structure with little space between particles
How are particles arranged in gases?	An irregular structure with large spaces between particles
What are the properties of a solid?	Fixed volume and shape that cannot flow or be compressed
What are the properties of a liquid?	Fixed volume, can flow/change shape, can't be compressed
What are the properties of a gas?	No fixed volume or shape, can be compressed
What is happening when a substance melts?	The particles gain energy and change from solid to liquid
What is happening when a substance freezes?	The particles lose energy and change from liquid to solid
What is happening when a substance evaporates?	The particles gain energy and change from liquid to gas
What is happening when a substance condenses?	The particles lose energy and change from gas to liquid
What equipment is used during filtration?	Funnel, filter paper and conical flask
How does filtration work?	Insoluble solids remains in paper and liquid passes through
What equipment is used during crystallisation?	Evaporating dish and bunsen burner
How does crystallisation work?	Liquid evaporates when heated and soluble solid crystallises
What equipment is used during distillation?	Round bottom flask, thermometer and condenser
How does distillation work?	Substances are boiled (evaporated) then cooled (condensed) they separate because they have different boiling points

Career Focus - Where could this take you?



I am an alcohol and drug technician. My job is to carry out alcohol and drug testing for workplaces, the police force and drug rehabilitation programmes. My main workplace is a laboratory where I test urine samples using techniques such as immunoassay and gas chromatography to help me identify the type and the amount of substances in a person's system. Chromatography is used for many applications and affects everything from what you eat to how we fight disease.

Challenge Activities



1. Make flashcards for the definitions and retrieval practice questions.
2. Make a mindmap for this topic. Remember to include keywords and the links between information.
3. Research the real-life applications for the different separating techniques. Who uses them in which careers?
4. Make a 3D model of the different states of matter - solid, liquid and gas.
5. Find out more about alcohol and drug technicians and what they do. What qualifications would you need for this career? What is the average salary?
6. Construct a fact file about a famous historical scientist that helped us to understand more about substances and particles.

Topic Links



This topic links to other science topics such as

- Scientific Skills
- Chemical reactions
- Energy

We will also be practising how to

- Use numerical data to identify states of matter
- Present using V21 skills

Additional Resources



Educake - <https://www.educake.co.uk/>
 BBC Bitesize - <https://www.bbc.co.uk/bitesize/topics/zkr4jxs/articles/z3qydm>
 YouTube Cognito - https://www.youtube.com/watch?v=vi_SJBnxmHo&list=PLldqqIGKox7WeOKVGHxcd69kKqtrwKl8W&index=5

- Describe forces and how they are measured
- Draw force diagrams

- Describe how friction works
- Explain how drag slows objects down

Keyword	Definition
Force	A push, pull or twist. Measured in newtons (N).
Contact Forces	Contact forces that act on objects that are physically touching.
Friction	This occurs when two objects move past each other. Friction slows objects down.
Air Resistance	This force is also known as drag. It is the force that acts on objects as they move through the air.
Upthrust	The upward force exerted by a fluid by an object floating on it.
Newton	Unit of force, symbol N.
Non-contact Forces	Non-contact forces that act between objects without them physically touching.
Gravitational Force	The force acting on an object due to gravity.
Magnetic Force	A force exerted by a magnetic field on a magnetic material.
Electrostatic Force	The force that acts between two charged objects.
Resultant Force	The overall force acting on the object that determines the movement of the object.
Streamlining	When an object is designed to reduce the resistance of air or water.
Newton Meter	A piece of equipment that measures the forces acting on an object.

Key Concepts

Contact Forces

Contact forces are **forces** that act between two objects that are physically touching each other.

Examples of contact forces include:

- **Reaction force** - An object at rest on a surface experiences **reaction force**. For example, a book on a table
- **Tension** - An object that is being stretched experiences a **tension** force. For example, a cable holding a ceiling lamp.
- **Friction** - Two objects sliding past each other experience **friction** forces. For example, a box sliding down a slope.
- **Air resistance** - An object moving through the air experiences **air resistance**. For example, a skydiver falling through the air.

Non-contact Forces

Non-contact forces are **forces** that act between two objects that are not physically touching each other.

Examples of non-contact forces include:

- **Magnetic force**
A magnetic force is experienced by any **magnetic** material in a **magnetic field**.
- **Electrostatic force**
An **electrostatic force** is experienced by any **charged particle** in an **electric field**.
- **Gravitational force**
A gravitational force is experienced by any **mass** in a gravitational field.

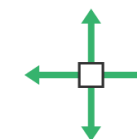
Friction and Drag (Air Resistance)

When an object is moving there are almost always forces which act against it, unless it is in a vacuum as in space. These are frictional forces and act in the opposite direction to the movement. Frictional forces make it more difficult for objects to move.

Drag is the force which acts against the movement on an object when it moves through a fluid (a liquid or gas). The faster the object moves the more drag it experiences. When the fluid is air, drag is usually described as air resistance.

Force Diagrams

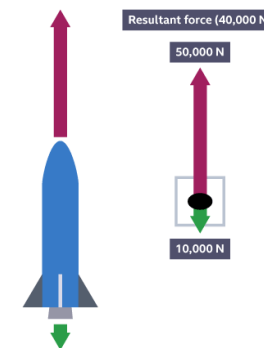
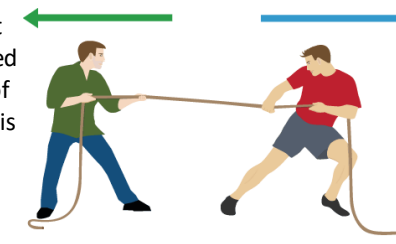
A **free body diagram** models the forces acting on an object. The object or 'body' is usually shown as a box or a dot. The forces are shown as thin arrows pointing away from the centre of the box or dot.



It is important to label each arrow to show the magnitude of the force it represents. The type of force involved may also be shown.

Balanced and Unbalanced Forces

Balanced forces are forces where the effect of one force is cancelled out by another. A tug of war, where each team is pulling equally on the rope, is an example of balanced forces.



If the forces acting on the object are not balanced then there is a resultant force acting on the object this means that the object is either accelerating or decelerating. It is **unbalanced forces** that cause 'changing motion'.



The aims of the sequence of learning are to ensure that all students:

- Describe forces and how they are measured
- Draw force diagrams

- Describe how friction works
- Explain how drag slows objects down



Retrieval Practice

Questions	Answers
What is a force?	A push, pull or a twist
What does a force do?	They can change the shape, speed or direction of an object.
How are forces represented?	Using arrows.
What are forces measured in?	Newtons (N)
Give an example of a contact force.	Tension, Friction, Upthrust, Air resistance, Thrust and Normal reaction force.
What is friction?	The force that slows an object down because it works in the opposite direction to the movement of the object.
What causes friction?	Contact between surfaces.
What is a drag force?	A resistance force caused by an object moving through a fluid (usually air or water)
How do drag forces slow objects down?	Particles from the fluid collide with the moving object providing a resisting force.
How can drag forces be reduced?	Making an object more streamlined.
What is a balanced force?	A force acting on an object in one direction that is the same size as a force acting in the opposite direction.
What happens if forces are balanced?	An object will remain stationary or will move at a constant speed.
What happens if forces are unbalanced?	The object's speed or direction changes.
How do you calculate resultant force?	Add together all the forces that are going in the same direction. The forces going in opposite directions will produce a resultant force that is calculated by taking the smaller magnitude a way from the larger one.

Career Focus - Where could this take you?



I am a mechanical engineer. I work in one of the oldest branches of engineering that combines engineering physics and math to manufacture and maintain mechanical systems/machines. I could be working on anything from nanotechnology to space stations as mechanical engineers are responsible for designing and developing most things. The skills I need to do this job include a good knowledge of science and math, an ability to come up with new ways of doing things, ability to use a computer and use my hands to repair and build machines.

Challenge Activities



1. Make flash cards to give examples of the different types of forces.
2. Create a mind map of the contact forces topic. Remember to include key words and links between information.
3. Design a vehicle to reduce the force of air resistance, draw a diagram and label its features.
4. Draw a series of force diagrams to show how the forces change when a football is stationary, accelerating and slowing down.
5. Research the scientist Robert Hooke and describe his law of elasticity.

Topic Links



- This topic links to:
- Organisation
 - Chemical Reactions
 - Space
- We will also be practising how to
- Calculate resultant force
 - Describe graphs

Additional Resources



To further practise and develop your knowledge see:

Educa ke - <https://www.educake.co.uk/>
 BBC Bitesize - <https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/zs3896f>
 YouTube Cognito - <https://www.youtube.com/watch?v=WCPTRaScgE>



Humanities

Our students will:

- know and understand the history of these islands as a coherent, chronological narrative, from the earliest times to the present day: how people's lives have shaped this nation and how Britain has influenced and been influenced by the wider world
- understand historical concepts such as continuity and change, cause and consequence, similarity, difference and significance, and use them to make connections, draw contrasts, analyse trends, frame historically-valid questions and create their own structured accounts, including written narratives and analyses
- understand the methods of historical enquiry, including how evidence is used rigorously to make historical claims, and discern how and why contrasting arguments and interpretations of the past have been constructed
- develop contextual knowledge of the location of globally significant places – both terrestrial and marine – including their defining physical and human characteristics and how these provide a geographical context for understanding the actions of processes
- understand the processes that give rise to key physical and human geographical features of the world, how these are interdependent and how they bring about spatial variation and change over time

Year 7 UNDERSTANDING OUR LOCAL AREA

The aims of the sequence of learning are to ensure that all students:

- Construct and analyse graphs
- Demonstrate how to collect data through fieldwork
- Evaluate how the local area can be improved

Keyword	Definition
Analysis	Studying or examining something in detail to discover or understand more about it, or your opinion and judgment after doing this
Brownfield Site	Areas that were once built on but are now derelict
Community	All the people living in a particular place
Congestion	Overcrowding or an excessive amount of people and traffic in a place
Density	A measurement of how many people are in an area
Development	The process of improving an area
Sustainable	Meeting the needs of people today without spoiling things for people in the future
Questionnaire	A set of questions with a choice of answers, devised for a survey
Neighbourhood	The area in which we live and share with our community
Urban	An area which has a lot of buildings
Vegetation	The amount of plants in an area

Key Concepts

How to draw a bar graph:

We need to follow the steps given below.

Step 1: First, decide the title of the bar graph.

Step 2: Draw the horizontal axis and vertical axis.

(For example, answers given)

Step 3: Now, label the horizontal axis.

Step 4: Write the names on the horizontal axis, .

Step 5: Now, label the vertical axis. (For example, Shop, Post Office)

Step 6: Finalise the scale range for the given data.

Step 7: Finally, draw the bar graph that should represent each category of the pet with their respective numbers.

Improving Areas

Suggesting how to improve an area, means understanding what is there and what the people need. It needs to be sustainable and not only support people now but what they might need in the future.



Conducting Environmental Surveys

An environmental quality survey uses an observer's judgement to assess environmental quality against a range of indicators. Often, they work on a sliding scale of quality (like 1 to 5).

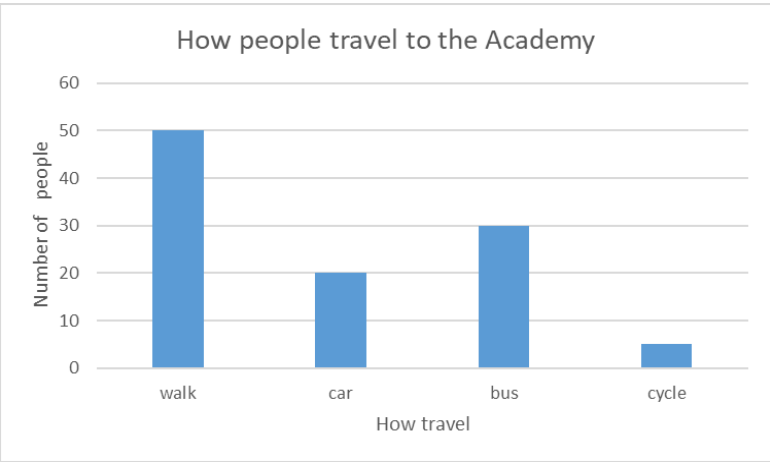
It is based on personal judgements, so the data collected using environmental quality surveys is **subjective**.

Urban Studies- An Environmental Quality Index			
Area			
Paving and Road	Hint	Score	
• No damage or broken paving, no uneven slabs, road surface in good repair		10	
• Some paving damaged, road showing some signs of need of repair		5	
• 50% or more paving or road surface in need of repair		0	
Litter			
• Completely clean, no litter		10	
• Some litter but not obtrusive		8	
• Litter over 50% of the area		5	
• Litter over 25% of the area		0	
Dereliction			
• Little evidence of dereliction		5	
• Extensive dereliction		2	
• Massive dereliction (Danger to children, cars, etc.)		0	
Street furniture (includes bollards, telephones, street lighting, litter bins, pillar boxes and road signs)			
• All items in good working order and maintenance		10	
• Some items in need of maintenance		5	
• A lot of items in need of maintenance		3	
• 100% derelict		0	
Advertisements			
• No advertisements in the street		5	
• Over 15 advertisements per 100m of street		0	
Air pollution			
• No pollution		5	
• Some pollution when wind is in right direction		4	
• Moderate pollution		2	
• Massive pollution: unbearable, unhealthy		0	
Nuisance			
• No appreciable noise		5	
• Some noise at certain times		4	
• Major noise problem		1	
• Intolerable noise		0	
Landscape/Vegetation	Hint	Score	
• One mature tree or 3 shrubs per 20m of pavement		10	
• One mature tree or 3 shrubs per 40m of pavement		8	
• One mature tree or 3 shrubs per 80m of pavement		4	
• Less than one tree/shrub per 100m of pavement		0	
Traffic parking (parking should be carried out at different times of the day ideally to assess the total situation)			
• No parked cars		5	
• Up to 4 parked cars per 100m of street		3	
• Over 10 parked cars per 100m of street		0	
Note: 1 commercial van = 1.5 cars 1 lorry = 2 cars 1 articulated lorry = 3 cars			
Traffic safety (vehicles and pedestrians)			
• Complete segregation of traffic and people- no danger		10	
• Cut-throats or play streets		8	
• Light traffic in both directions		6	
• Moderate traffic		4	
• Heavy traffic		2	
• Major through route-very heavy traffic		0	
Building Condition (walls and roof)			
• All buildings well maintained		5	
• Half the buildings in the street well maintained		3	
• Over 20% of the buildings semi-derelict (very poor structural order, ready for demolition and clearance)		0	
Condition of boundary walls and fences			
• All in well maintained condition		5	
• 20% need maintenance		3	
• Over half in need of repair and maintenance		0	
General Housekeeping (condition of gardens, forecourts, cleanliness of paintwork, windows and curtains)			
• All well maintained and tidy		5	
• All in reasonable condition		4	
• 25% badly maintained		2	
• Over 50% badly maintained		0	
Total Environmental Quality Score = _____			

- Construct and analyse graphs
- Demonstrate how to collect data through fieldwork
- Evaluate how the local area can be improved



Retrieval Practice

Questions	Answers										
What is a brownfield site?	Areas that were once built on but are now derelict										
What is the first step when drawing a bar graph?	Creating a title for the graph										
What is used to gather data on an area?	An environmental survey										
What does sustainable mean?	Meeting the needs of people today without spoiling things for people in the future										
<p>In the space show the following data in a bar graph for how people travel to the academy:</p> <p>Walk: 50 Car: 20 Bus: 30 Cycle: 5</p>	 <table border="1"> <caption>How people travel to the Academy</caption> <thead> <tr> <th>How travel</th> <th>Number of people</th> </tr> </thead> <tbody> <tr> <td>walk</td> <td>50</td> </tr> <tr> <td>car</td> <td>20</td> </tr> <tr> <td>bus</td> <td>30</td> </tr> <tr> <td>cycle</td> <td>5</td> </tr> </tbody> </table>	How travel	Number of people	walk	50	car	20	bus	30	cycle	5
How travel	Number of people										
walk	50										
car	20										
bus	30										
cycle	5										



Career Focus - Town Planner



As a town planner, you may work on projects to assess the effect of new rail links or roads, plan for houses and renewable energy generation, redesign urban spaces and develop parks. You could develop local or national planning policies for government, developers and the public.

Challenge Activities



- Design and explain how Newsome Mill could be developed to serve the needs of the local community.
- Create a mood to highlight Newsome and how it could be developed in the future
- Research Newsome or Newsome Mill write a report on how the area (land use/buildings/people) has changed over time.

Topic Links



This topic links to:

- Maths
- Science

Additional Resources



To further practise and develop your knowledge see:

Urban Change



Graphs





The aims of the sequence of learning are to ensure that all students:

- Explore Pompeii and what it can tell us about the Romans.
- Evaluate all aspects of Roman life. Including; Women, Slaves, Entertainment and Technology.

- Explain how 'advanced' the Romans were through the support of own knowledge.
- Reach a judgement on whether the Romans were 'advanced' or 'not advanced' using evidence to support.

Keyword	Definition
Society	A community, nation, or broad grouping of people having common traditions, institutions, and collective activities and interests.
Pompeii	A Roman city located in Southern Italy which was buried after the eruption of Mount Vesuvius
Pyroclastic flow	A hot mixture of rock fragments, gas and ash which travel rapidly. Extremely destructive and deadly due to their high temperature.
Pliny the Younger	Roman statesman who was nearby when the eruption took place and witnessed the event. The only eyewitness account ever written.
Divorce	The ending of a marriage by one person or both.
Slavery/Slave Markets	Romans bought and sold people at slave markets to own them as property.
Gladiator	Professional fighters in Ancient Rome who fought in front of a crowd for entertainment.
Lanista	Trainer of Gladiators at Gladiatorial school.
Colosseum	A giant Roman Amphitheatre in the centre of Rome, Italy.
Technology	The use of knowledge to invent new devices or tools.
Aqueduct	A bridge designed to carry water long distances.
Hypocaust	A Roman under-floor central heating system.
Advanced	Far on in time or course and being beyond others in progress or ideas.
Not Advanced	Undeveloped or little progress made, often in a specific area.

Key Concepts

Pompeii:

A volcano called Mount Vesuvius erupted and buried the city of Pompeii under volcanic ash, cinders and blasts of hot air with temperatures of up to 250C. One of the victims was Pliny the Elder, who tried to rescue people on boats. His nephew Pliny the Younger witnessed this and wrote about the events.

The eruption of Vesuvius in 79AD was quite sudden. Most of the 5000 victims lost their lives while going about their daily work. For over 1500 years, people had forgotten that Pompeii even existed. In 1748, the excavation of Pompeii began and archaeologists are still working on the site to this day, nearly 300 years later. A lot of what we know about the Romans' daily life comes from what was found while excavating Pompeii.



Family Life:

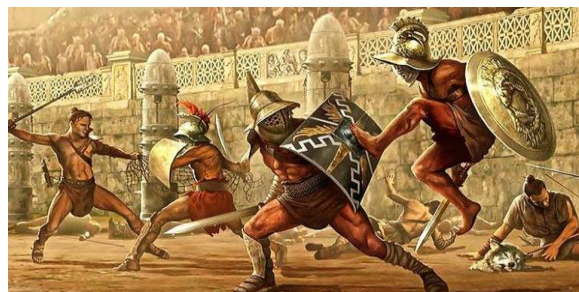
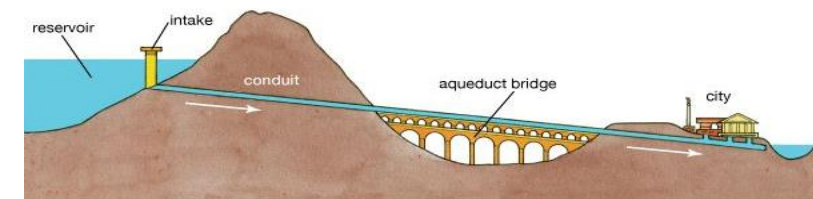
The family unit was very important to the Romans and Father (*Paterfamilia*) was head of the household. Everyone had to obey him as he had legal authority over his family and slaves. However, usually Mother (*Materfamilia*) had a strong say in what went on in the family and often handled the finances and managed the household.

Roman Women were treated differently depending on their status. Wealthy women had lots of independence, especially if they were widows and they could own and inherit property. A wife of a poor family, always had to obey her husband, and if he died, she was then under the control of her son or another male relative.

Slaves were usually bought and owned by rich families. They would cook and clean and carry out hard work on the land. They would even look after the children. Sometimes they were treated very badly but some were lucky and had kind masters. Sometimes slaves could be freed if they had served their master well.

Roman Technology:

The Romans were great builders, engineers, architects and inventors. They invented many things that we still use in our everyday lives, 2000 years later. When the Romans came up against problems that needed technological solutions, they usually found a way of solving them. The Romans lived in blocks of flats while people in England lived in little huts, they invented **aqueducts** (bridges that carried water – see diagram below) to bring water to their cities. They invented the **Hypocaust** (under-floor central heating system), proper **roads** (to move troops quickly), **amphitheatres** (like the Colosseum, a 50,000 all seater stadium with a retractable roof) and **pumps** to allow them to get precious water from the ground.



Entertainment:

Roman gladiators were trained in mortal combat, a form of public entertainment in Ancient Rome. The word gladiator comes from the Latin word gladius (sword). The popularity of the games grew and spread throughout the Roman Empire. The Colosseum in Rome opened in AD 80 (C.E.) and though many gladiators were slaves and prisoners of war, some were Roman citizens that wanted fame and fortune. Many gladiators came from the lands Rome had conquered (like Verus). Gladiators were supposed to fight to the death but, in reality, if they fought extremely well but lost, they had a 90% chance of surviving. Also, gladiators were well paid. For one fight a gladiator could earn a Roman soldier's annual wage!



The aims of the sequence of learning are to ensure that all students:

- Explore Pompeii and what it can tell us about the Romans.
- Evaluate all aspects of Roman life. Including; Women, Slaves, Entertainment and Technology.

- Explain how 'advanced' the Romans were through the support of own knowledge.
- Reach a judgement on whether the Romans were 'advanced' or 'not advanced' using evidence to support.



Retrieval Practice

Questions	Answers
In what year did Mount Vesuvius erupt and describe what happened?	79AD and 5000 victims lost their lives
Tell me two things we learnt about the Romans through the discovery of Pompeii:	Their daily life and some of the jobs they did
Give two ways Roman women were 'advanced':	Wealthy women had lots of independence and if they were widows, they could own and inherit property.
What was lifelike for Roman children? Explain with examples.	They studied subjects such as reading, writing, maths, literature, and debate. School was mostly for boys, however some wealthy girls were tutored at home. Poor children did not get to go to school. Most Romans ate a light breakfast and little food during the day.
What jobs were slaves expected to do in the Roman Empire?	They would cook and clean and carry out hard work on the land. They would even look after the children.
How could a Roman slave earn their freedom?	If they had served their master well
Tell me three forms of entertainment the Romans enjoyed:	Gladiator battles, chariot racing and mock battles
How did a Roman Aqueduct work and how was it 'advanced'?	They were bridges that carried water over a valley to bring water to their cities
Tell me two things that you would find in a rich Romans house:	Marble pillars and mosaics
Why did the Roman Empire collapse? Explain with examples.	There were 3 main reasons for the fall of Rome which are: political instability, economic and social problems, and finally a weakening of the frontiers/borders especially in the east

Career Focus - Where could this take you?



I am an Archaeologist: My job is to excavate (slowly dig) using spoons, knives, picks, brushes, and other tools. I am looking for material remains so that I can study features of human history through artefacts which were created, modified or used by people in the past. I will then use what I've uncovered to learn about how people lived in specific times and places. Artefacts also help me understand what people's daily lives were like, how they were governed, how they interacted with each other and what they believed and valued.

Challenge Activities



1. Research and create a booklet on any aspect of Roman Society. This could include; women, slaves, children, food, the Government. It must have information of your own and pictures included.
2. Instead of Roman Society, you might decide to base your research and create a booklet on a famous Roman. Some examples of famous Emperors are Marcus Aurelius, Nero, Claudius, Caligula and Commodus. Other famous people from the Roman times include Julius Caesar, Boudica (a British woman who rebelled against the Romans and burnt London!), Cicero, Vercingetorix and Togodumnus.
3. Create a food menu based on what the Romans liked to eat – you will need a Starter, First Course, Second Course, Third Course and a Dessert. They enjoyed food!

Topic Links



This topic links to other humanities topics such as:

- Roman Army
- Medieval Britain
- The Slave Trade
- Tectonics

We will also be practising how to:

- Create a balanced argument
- Make a judgement as a Historian

Additional Resources



To further practise and develop your knowledge see:
<https://www.historyonthenet.com/roman-society-and-social-classes>

<https://www.bbc.co.uk/bitesize/topics/zwmpfg8/articles/z2sm6sg>


https://www.youtube.com/results?search_query=roman+society+ks3



The aims of the sequence of learning are to ensure that all students:

- Investigate the Samskaras & explain the sacred thread ceremony
- Identify & explain the symbolism of a puja tray & how these are used in worship, compare worship at home & the Mandir

- Describe the symbolism in the Hindu Marriage ceremony
- Research Hindu festivals of Navratri & Holi
- Discuss the role of pilgrimage: purpose, practices & sacred sites
- Discuss the importance of Hindu environmental projects & charities

Keyword	Definition 
Hinduism	A religion which has cultural traditions which developed from Vedic religion.
Samskaras	A ceremony or a rite, which marks a major event in the life of a Hindu.
Sacred	Something that is dedicated or set apart for the services or worship of a deity; is considered worthy of spiritual respect or devotion.
Ceremony	A set of acts, often traditional or religious, performed at formal occasions. In Hinduism rituals are performed to bring spirituality into human life.
Symbolism	Hinduism is rich on symbolism. Many acts of worship, such as puja are symbolic. Symbolism is the idea that things represent other things.
Pilgrimage	A journey, especially a long one, which is made to some sacred place as an act of religious devotion. Pilgrimage in Hinduism is the practice of journeying to sites where religious powers, knowledge, or experience have been marked or been present.

Key Concepts

Samskaras

Religious people often have ceremonies to mark changes in their life. Hindu rites of passage cover a person's birth to their death through various traditions and customs.

Hindu sacraments are called 'sanskars'

The sacraments performed at the time of a wedding are called 'Vivah Sanskar'. This sanskar marks the start of the second and the most important stage of life called the 'Grihista Ashrama' which involves setting up of a new family unit.



Sacred Thread ceremony (Upanayana)

The Sacred Thread ceremony is a ceremony for boys in some Hindu communities to confirm they are of an age to take on religious responsibility.

Girls are sometimes honoured in the same way, but it is rare for them to receive and wear the thread.

In some Hindu communities, the male participant's head is shaved for the ceremony, symbolising a cleansing from their old ways of living. New clothes are put on after bathing. Gifts and blessings from family and friends are often received.

In some communities, the person asks family and friends for **alms** to show that they no longer expect the family to automatically provide for them now they are an adult.

Features of the Sacred Thread ceremony include:

- The **Janoi** is made up of three strands, representing purity of thought, words and actions
- The cotton strands go over the left shoulder and under the right arm
- Janoi wearers may chant a special **mantra** when putting on and taking off their sacred thread
- Vows are made to obey all aspects of the first **ashrama**
- Some young Hindus also accept a **Guru** at this point and start their study of **scripture**. It is increasingly common for young Hindus in the UK and in urban India to have the ceremony at different ages.

- The aims of the sequence of learning are to ensure that all students:
- Investigate the Samskaras & explain the sacred thread ceremony
 - Identify & explain the symbolism of a puja tray & how these are used in worship, compare worship at home & the Mandir

- Describe the symbolism in the Hindu Marriage ceremony
- Research Hindu festivals of Navratri & Holi
- Discuss the role of pilgrimage: purpose, practices & sacred sites
- Discuss the importance of Hindu environmental projects & charities



Key Concepts

Puja Tray



The Puja Tray

- On the puja tray there is
- A pot of water for ritual cleansing.
- A bell to call the family to worship.
- A tiny pot of red gum paste to mark the forehead. This mark means that a woman's soul (her husband) is with her.
- An Aarti lamp for the Aarti ceremony.
- An incense burner or jos stick holder.



Holi

A Hindu festival that celebrates spring, love, and new life. Some families hold religious ceremonies, but for many Holi is more a time for fun. It's a colourful festival, with dancing, singing and throwing of powder paint and coloured water. **Holi is also known as the "festival of colours".**



Kumbh Mela

One of the most important pilgrimages in Hinduism is **Kumbh Mela**. This is the largest gathering of people in the world. Millions of people attend and bathe in the Ganges (in North India). The main Kumbh Mela gathering takes place every 12 years, with other events taking place every three years at four different sites (a different site is used every three years).

Hindu Pilgrimage


Hindu practices allow those who follow the religion to demonstrate their commitment to the faith and this includes worshipping in temples and at shrines. Hindu practices might also involve showing a commitment to the wider community, such as pilgrimage and charity work.

Varanasi

The most sacred city in Hinduism is **Varanasi**, as it is one of the oldest and most respected cities. It is believed to be the city where **Shiva**, the god of destruction, lived a long time ago. The **River Ganges**, which is one of the most sacred rivers in the world, runs through the city and is important as it is where Hindus bathe in the hope, they can wash their sins away. A lot of Hindus believe that people who die in the city of Varanasi can achieve moksha.

Retrieval Practice	
Questions	Answers
What are Samskaras?	Samskaras are rites of passage within Hinduism. Marking important event within their life.
Why is the thread ceremony important within Hinduism?	The Sacred Thread ceremony is a ceremony for boys in some Hindu communities to confirm they are of an age to take on religious responsibility. This represents a new beginning as well as maturity to help and provide for their family.
Whose story lies between the festival of Holi?	The story of Holika and Prahlad. The story behind Holi is about good triumphing over evil.
What do Hindus use in worship?	Hindus use a puja tray, when they are worshipping.
Where do Hindus go for pilgrimage?	Hindus go to Varanasi, as this is the sacred site in Hinduism.
Why is Varanasi a sacred site for Hindus?	It is believed to be the city where Shiva , the god of destruction, lived a long time ago. The River Ganges , which is one of the most sacred rivers in the world, runs through the city and is important as it is where Hindus bathe in the hope, they can wash their sins away. A lot of Hindus believe that people who die in the city of Varanasi can achieve moksha.
Why do Hindus celebrate Navratri?	Navratri is a time when Hindus celebrate the goddess Durga for killing the demon, Mahishasura. Nav means nine and Ratri means nights . Hindus celebrate Navratri by dancing and different colours which symbolises one of her distinct characteristics. Many Hindus wear a different coloured traditional outfit each day to reflect this.

Career Focus - Where could this take you?



Global coordinator for Hindu Swayamsevak Sangh: "I love to help around and look after the plants and the world around us, there is a famous slogan which states 'Service to Mankind is Service to God' this motivates me to help the people and the communities around me."

"Religious education has given me skills to understand the world we live in now, how animals and humans need to be looked after, as well as the world around us. Our community projects have included; Voluntary work at Old People Homes, Blood Donation, Distribution of fruit to local hospitals, trees planting, careers fair etc."

Challenge Activities

- Explain the stories behind the festivals of Holi and Navrati. Why are they important to Hindus today?
- Can you name any other sacred events within a life of a Hindu?
- Create a leaflet for someone to explain the key practices of Hinduism.
- Research the different Gods/Goddesses in Hinduism and create flash cards.
- Make your own puja tray and take a picture of it.

Don't forget!
Point
Explain
Evidence (Quote)

Topic Links

This topic links to other RE topics such as

- Sikhism
- Buddhism

Cross curricular subjects include:

- Geography

We will also be practising how to



- Argue a point and practise our Voice 21
- Participate in debates
- Write PEE sentences/how to answer exam questions

Additional Resources

To further practise and develop your knowledge see:

<https://www.bbc.co.uk/bitesize/topics/zh86n39/articles/z4qqy9q>

<https://www.bbc.co.uk/religion/religions/hinduism/ritesrituals/weddings.shtml>



Our students will:

- understand and respond to spoken and written language from a variety of authentic sources
- speak with increasing confidence, fluency and spontaneity, finding ways of communicating what they want to say, including through discussion and asking questions, and continually improving the accuracy of their pronunciation and intonation
- can write at varying length, for different purposes and audiences, using the variety of grammatical structures that they have learnt
- discover and develop an appreciation of a range of writing in the language studied.

- The aims of the sequence of learning are to ensure that all students:
- Recognise some differences between school in France and the UK.
 - Learn how to say what they like and dislike at school.
 - Learn how to describe their school uniform.

- understand and learn how to give some simple opinions about school subjects..
- understand and learn how to tell the time in French.

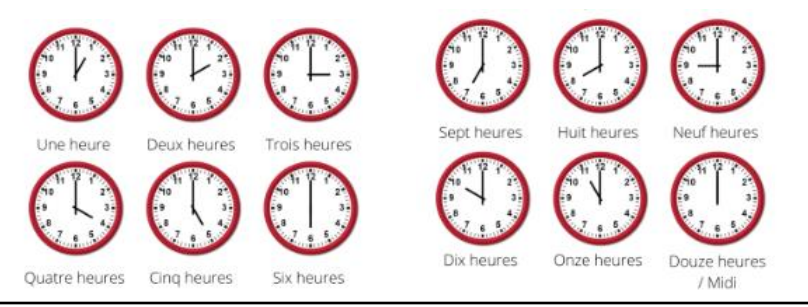
Keyword	Translation
Au collège.....	At school.....
Comment s'appelle ton collège?	What is your school called?
Qu'est-ce que tu as aujourd'hui?	What do you have today?
Qu'est-ce que tu penses de tes matières?	What do you think about your subjects?
Car Parce que	because
Qu'est-ce que tu portes?	What do you wear?
Qu'est-ce que tu penses de ton uniforme?	What do you think about your uniform?
Ta journée scolaire est comment?	What is your school day like?
À quelle heure?	At what time?

Key Concepts

School subjects.



Telling the time



Giving opinions.

aimer, adorer and **détester** are **-er** verbs.

Tu aimes ...?	Do you like ...?
Oui, ...	Yes, ...
j'adore ...	😊 I love ...
j'aime ...	😊 I like ...
j'aime assez ...	😊 I quite like ...
Non, ...	No, ...
je n'aime pas ...	😞 I don't like ..
je déteste ...	😞 I hate ...

a C'est facile. 🙌	b C'est difficile. 😞	c C'est intéressant. 😊
d C'est ennuyeux. 😞	e C'est amusant. 😄	f C'est créatif. 🧑🎨
g C'est nul. 🙄	h Le / La prof est sympa. 🧑🏫	i Le / La prof est trop sévère. 🧑🏫

Describing your uniform.

un	pantalon / pull / sweat / polo	noir / bleu / vert / gris / blanc / violet / rouge / rose / jaune
une	jupe / veste / chemise / cravate	noire / bleue / verte / grise / blanche / violette / rouge / rose / jaune
des	chaussettes / chaussures / baskets	noires / bleues / vertes / grises / blanches / violettes / rouges / roses / jaunes



- Recognise some differences between school in France and the UK.
- Learn how to say what they like and dislike at school.
- Learn how to describe their school uniform.
- understand and learn how to give some simple opinions about school subjects..
- understand and learn how to tell the time in French.

Retrieval Practice



Questions	Answers
Comment s'appelle ton collège?	Mon collège s'appelle Newsome Academy
Qu'est-ce que tu as aujourd'hui?	C'est lundi et j'ai les maths, l'anglais, l'histoire, le dessin et le Français.
Qu'est-ce que tu penses de tes matières?	J'aime les maths mais je n'aime pas la musique.
Pourquoi?	La musique c'est difficile et les maths c'est cool.
Qu'est-ce que tu portes?	Je porte une veste noire, une chemise blanche, un pantalon noir et des chaussures noires.
Qu'est-ce que tu penses de ton uniforme?	Je pense que l'uniforme est confortable
Ta journée scolaire est comment?	J'arrive au collège a neuf heures . A midi je mange et a trois heures je joue au foot.
À quelle heure?	A dix heures, j'ai les sciences.

Career Focus - Where could this take you?



I am a fashion designer. I design and make clothing. I use languages to communicate with customers overseas and I do research to see what sells abroad. I can also travel to the fashion fairs throughout the world.

Challenge Activities



1. Create a graffiti wall about your likes and dislikes at school.
2. Research some differences and similarities about French and British schools.
3. Design your timetable in French. Don't forget the days in French too.
4. Design your ideal school uniform and label it in French.

Topic Links



This topic links to:

- Colours
- Likes and dislikes

Additional Resources



To further practise and develop your knowledge see:

- Language nut.
- Oak academy.

Your teacher can remind you of your login.



Computing

Our students will:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology

The aims of the sequence of learning are to ensure that all students:

- Describe the Scratch layout
- Describe the meaning of a range of different scripts in Scratch
- Describe the appropriate use of a range of blocks and scripts in Scratch

The aims of the sequence of learning are to ensure that all students:

- Evaluate the use of blocks and scripts used to create a range of programs in Scratch
- Describe the definitions of some keywords in Scratch

Keyword	Definition
---------	------------

Sprite	The programmable images on a Scratch program screen.
---------------	------------------------------------------------------

Script	The set of instructions that is used to program in Scratch, usually presented as a collection of blocks that connect with one another.
---------------	----------------------------------------------------------------------------------------------------------------------------------------

Costume	The different "frames" or alternate appearances of a sprite. Sprites can change their look to any of its costumes.
----------------	--------------------------------------------------------------------------------------------------------------------

Comment	Adjustable yellow coloured textboxes that can be attached to blocks, or left floating, used to add detail to a program.
----------------	-------------------------------------------------------------------------------------------------------------------------

Sequencing	The specific order in which instructions are performed in a program. If the sequence is incorrect it may cause errors in a program.
-------------------	-------------------------------------------------------------------------------------------------------------------------------------

Variable	A variable represents a location in memory. It is used to hold a value which you assign to it e.g. 'Lives' = 3
-----------------	----------------------------------------------------------------------------------------------------------------

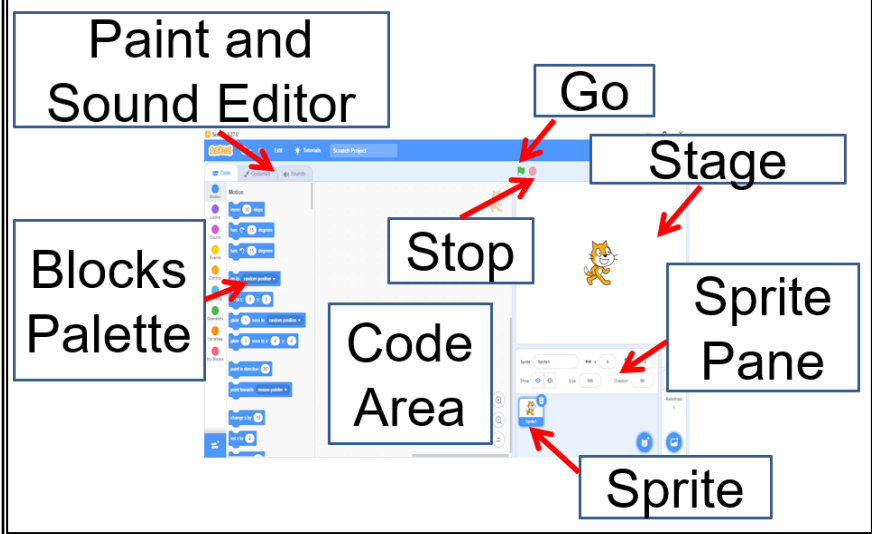
Broadcasting	Used to communicate between sprites or linked scripts to control when specific scripts are run in a program
---------------------	-------------------------------------------------------------------------------------------------------------

Iteration (Loop)	The repetition of a sequence of instructions
-------------------------	----------------------------------------------

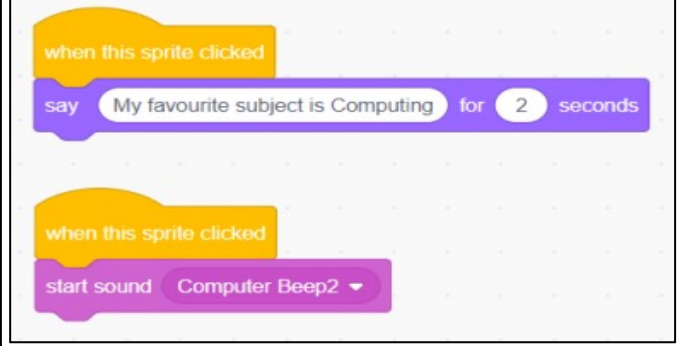
Conditional Statement	Evaluates the state of a program to determine whether something is either true or false. If true, the conditional script will be used
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Key Concepts

The Scratch layout

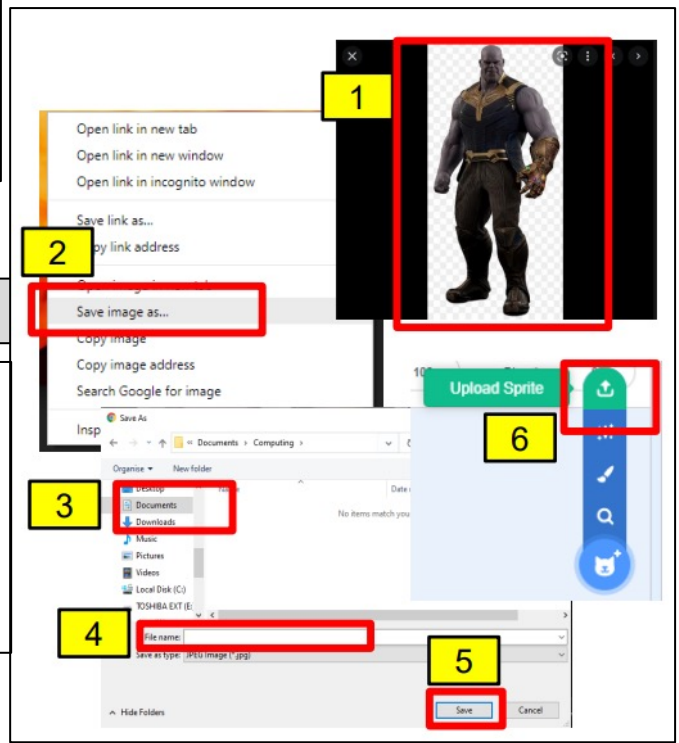


How to code an interactive sprite



How to add custom Sprites

1. Find a high resolution transparent image
2. Right click > Save image as...
3. This PC > Documents > Computing
4. Rename the file to something appropriate
5. Press Save
6. In Scratch > Upload Sprite





- Describe the Scratch layout
- Describe the meaning of a range of different scripts in Scratch
- Describe the appropriate use of a range of blocks and scripts in Scratch

- Evaluate the use of blocks and scripts used to create a range of programs in Scratch
- Describe the definitions of some keywords in Scratch




Retrieval Practice



Questions

Answers

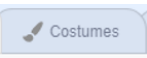
How do you add a new sprite in Scratch?

 Go to the bottom right hand side of the scratch screen and click on the button called "Choose New Sprite". The button looks like a cat.

What happens when you click on the 'Green Flag' and 'Red Button' on Scratch?

  Green Flag: Starts the running of scripts
Red Button: Stops the scripts from running

How do you change the costume of a sprite used in the program?

 Go to the top right hand side of the scratch screen and click on the tab called "Costumes"

When using the 'point in direction' block, what will the numbers 0, 180, -90 and 90 do to the sprite?

This block changes the direction of the sprite:

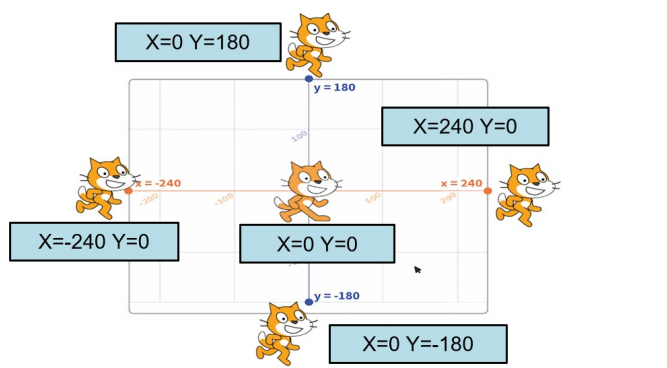


Number	Sprite Direction
0	Sprite faces upwards
180	Sprite faces downwards
-90	Sprite faces towards the left
90	Sprite faces towards the right

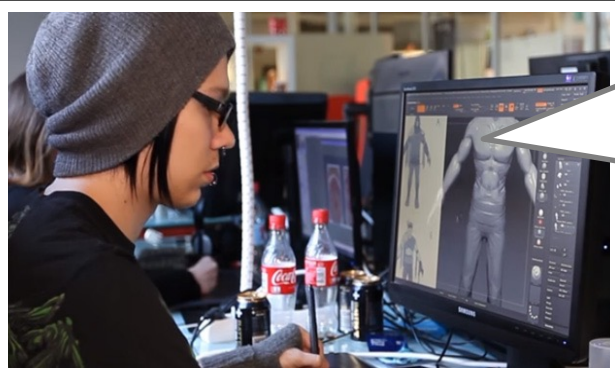
How can you correctly use the 'go to...' block to place sprites in set positions on the stage area.

Use the correct X and Y co-ordinates in the 'go to' block.

For example:



Career Focus - Where could this take you?



I am a **3D modelling artist** and create the models for all 3D art assets within the game – characters, weapons, vehicles, furniture, trees, rocks and so on. Often I start with a brief or 2D drawing from a concept artist

Challenge Activities

1. Create a two player game in Scratch that uses all of the blocks, scripts and techniques you have covered in this unit. Also, research the internet and include the use of new blocks and scripts that have not been covered in this unit.
2. Create a poster on MS PowerPoint that includes one or all of the following details: variables, broadcasting and conditional statements.
3. Create a short vlog about the types of careers you could get into within the gaming industry. Explain what each type of job would involve and which opportunities would be of interest to you.

Topic Links

- This topic links to:
- Computing Curriculum: Understand how instructions are stored and executed within a computer system and create, re-use, revise and re-purpose digital artefacts for a given audience
 - Mathematics: use of logical inference, problem-solving skills and simple algebra

Additional Resources

- To further practise and develop your knowledge see:
- <https://scratch.mit.edu/>
 - <https://www.youtube.com/c/ScratchTeam>



Our students will:

- produce creative work, exploring their ideas and recording their experiences
- become proficient in drawing, painting, sculpture and other art, craft and design techniques
- evaluate and analyse creative works using the language of art, craft and design
- know about great artists, craft makers and designers, and understand the historical and cultural development of their art forms.

- develop competence to excel in a broad range of physical activities
- are physically active for sustained periods of time
- engage in competitive sports and activities
- lead healthy, active lives.



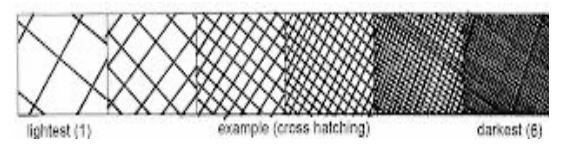
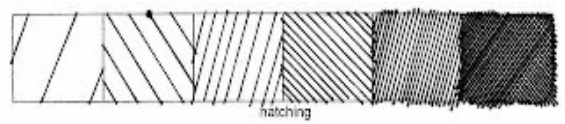
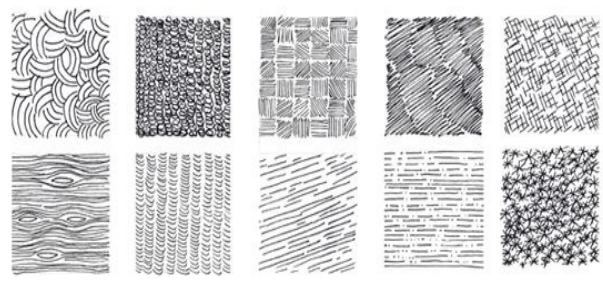
- Describe multiple methods for mark making
- Describe complementary colours
- Synthesise a 3D drawing by employing mark making techniques



Keyword	Definition
Colour	What you see when light reflects off something. Red, yellow and blue are primary colours
Line	A mark which can be long, short, wiggly, straight etc
Tone	How light or dark something is
Texture	How something looks or feels, e.g. rough or smooth
Pattern	A symbol or shape that is repeated
Shape	A 2D area which is enclosed by a line, e.g. a triangle
Form	Something which has 3 dimensions, e.g. a cube, sphere or sculpture

Key Concepts

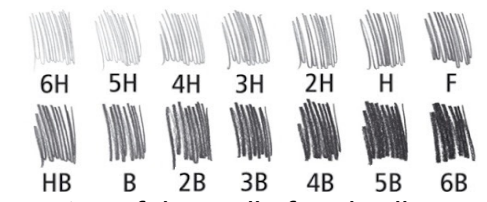
Mark Making describes the different lines, dots, marks, patters we create in an artwork. It can be loose and gestural or controlled and neat. **Mark Making** can be used to create texture in an artwork.



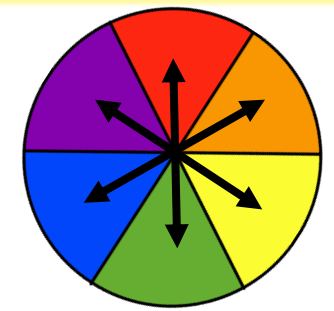
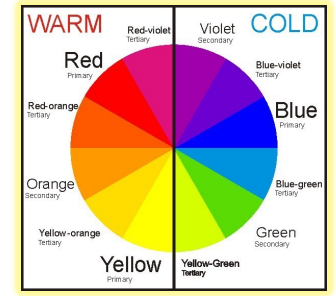
Grades of Pencils

Pencils come in different grades, the softer the pencil, the darker the tone.

H = Hard B = Black

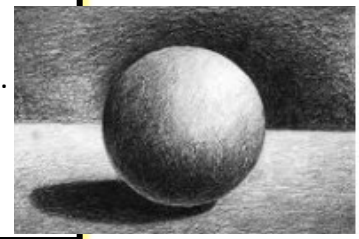


In art the most useful pencils for shading are B, 2B and 4B. If your pencil has no grade it is likely to be HB.



Making something look 3D

To prevent objects looking flat, a range of tonal shading is essential to make them appear 3D. Shading straight across a surface will make an item appear flat. Shading with the form will help to enhance the 3D surface.





- Describe multiple methods for mark making
- Describe complementary colours
- Synthesise a 3D drawing by employing mark making techniques



Retrieval Practice

Questions	Answers
What are complementary colours	These are colours that are found opposite each other on the colour wheel. Complementary colours are pairs of colours that contrast with each other more than any other colour, and when placed side-by-side make each other look brighter.
What are primary colours?	Red, blue and yellow. These are colours that cannot be made by mixing other colours together but are used to make all other colours.
What are secondary colours?	Green, orange and purple. Secondary colours are made by mixing two primary colours together.
What are tertiary colours?	These are colours created by mixing a primary and a secondary colour together.
What are harmonious colours?	These are colours that are next to each other on the colour wheel.
What is tint?	When you add white to a colour to make it lighter
What is shade?	When you add black to a colour to make it darker.
What is a primary source?	Observational drawing: drawing something directly from first-hand experience. Drawing from something real that is in front of you.
What is a secondary source?	Observational drawing: drawing from something that was produced by another person

Career Focus - Where could this take you?



I am a **magazine art director** and my job is to put together the illustrations and photographs for my magazine to ensure that the articles look interesting and people purchase our magazine

Challenge Activities



1. Draw an object using your mark making techniques to make it appear to be 3D.
2. Create a complementary colour wheel

Topic Links



- This topic links to:
- Maths – ratios of mixing paints to make various colours
 - Science – accurate observation skills

Additional Resources



To further practise and develop your knowledge see:




Here you will find why art education is important from artists, young people and major cultural figures.

Keyword	Definition
Timing	Moving to the beat of the movement
Choreographic Intention	What it makes the audience think, see and feel.
Gesture	A movement that doesn't transfer weight.
Dynamics	The quality of the movement.
Unison	All together at the same time
Cannon	One after the other.
Speed	How fast or slow a movement is.
Confidence	Showing you know what you are doing and where you should be
Stamina	The ability to keep energy going over time
Flexibility	The range of movement around a joint
Strength	A combination of maximum speed and power
Coordination	The ability to move two or more body parts at the same time to create a movement
Energy	Performing all movements with as much effort as possible
Power	Is a combination of using speed and strength
Reaction time	The time it takes for you to respond to a stimulus
Accuracy	Making sure movements are the way they were taught
Facial Expression	Showing the mood of the character
Dynamics	The quality of a movement
Speed	How fast or slow a movement is

Key Concepts



Merce Cunningham



Cunningham technique focuses on the 5 movements of the back; tilt, twist, curve, arch and straight. He also invented chance choreography which used random methods to determine the movements, staging and music.

- mirroring – this technique requires dancers to do the same travel, jump, shape or balance at exactly the same time
- leading and following – these movements require one dancer to lead and the other partners to follow
- meeting, avoiding or passing by – these movements require dancers to travel towards each other and then move right or left to avoid and pass
- meeting and parting – these movements require dancers to meet, turn and travel away
- canon – this technique requires dancers to take it in turns to perform a movement that is then identically copied and performed by others
- unison – this technique requires dancers to move at the same time as each other
- contrasting – this technique requires dance partners to perform contrasting movements to each other



- The aims of the sequence of learning are to ensure that all students:
- Define and spell key elements apply key elements in performance
 - Describe elements in a performance
 - Apply dance skills and techniques

- perform with timing, extension and fluency.
- develop dance by using choreographic devices.
- Demonstrate leadership skills



Retrieval Practice

Questions	Answers
What are performance skills?	Performance skills are those used during a performance they set dancing apart from mechanical movement they draw the audience's attention and helps to show mood and meaning.
What are physical skills?	A Physical skill is a skill that can be developed over time
What is balance?	The ability to maintain a centre of mass over a base whilst stationary (Static) or during movement (dynamic)
What are the six basic actions?	Travel, Turn, Jump, Stillness, Transfer of weight and Gesture.
What is focus?	Where the dancer looks: into space; at the audience; at another dancer or a body part

Career Focus - Where could this take you?



I am a **Personal Trainer** and it is my job to work with people on their physical skills and abilities. I designed workout routines and support clients in achieving their goals and improving their performance.

Challenge Activities



[Interview and examples of work](#)

[An interview with Cunningham and Cage.](#)

Topic Links



- This topic links to:
- Drama Performance skills
 - PE - Physical skills
 - English - Understanding terminology and verbs.
 - Maths - Problem solving


Additional Resources



- To further practise and develop you knowledge see:
- <https://www.bgsperformingarts.com/drama.html>
 - http://www.kneehigh.co.uk/page/about_kneehigh.php
 - <https://www.bbc.com/bitesize/subjects/zbckjxs>

Keyword	Definition
Six basic Actions	Travel , Turn, Jump, Gesture, Stillness, Transfer of weight.
Choreographic Intention	To make the audience think see and feel.
Gesture	A movement that doesn't transfer weight.
Dynamics	Quality of movement. How you move.
Unison	All together at the same time.
Cannon	One movement after the other.
Speed	How fast or slow a movement is.

Key Concepts	
<p>Performance Skills</p> <p>Performance Skills -: Performance skills are those used during a performance they set dancing apart from mechanical movement they draw the audience's attention and helps to show mood and meaning.</p> <p>Timing : Moving to the beat of the movement.</p> <p>Confidence : Showing you know what you are doing and where you should be.</p> <p>Energy: Performing all movements with as much effort as possible.</p> <p>Accuracy: Making sure movements are they way they were taught.</p> <p>Focus: Where the dancer looks. Into space, at the audience, Another dancer, A body part.</p> <p>Facial Expression : Showing the mood of the character.</p> <p>Dynamics : The quality of the movement.</p> <p>Speed : How fast or slow a movement is.</p>	<p>Physical skills</p> <p>Physical skill: A Physical skill is a skill that can be developed over time.</p> <p>Stamina: The ability to keep energy going over time.</p> <p>Flexibility : The range of movement around a joint.</p> <p>Strength :A combination of maximum speed and power.</p> <p>Coordination : The ability to move two or more body parts at the same time to create a movement.</p> <p>Balance: The ability to maintain a centre of mass over a base whilst stationary (Static) or during movement (dynamic)</p> <p>Power : Is a combination of using speed and strength</p> <p>Reaction time: The time it takes for you to respond to a stimulus.</p>

Retrieval Practice 	
Questions	Answers
What is musical Theatre?	A story told through Music dance and drama.
What is a theme ?	A reoccurring idea that runs through the dance.
What is a Stimulus ?	An initial idea or starting point.
What is choreography?	The art of making dancers.
What is a motif ?	A motif is a movement phrase (a short dance) that can be repeated and developed throughout the dance.

Career Focus - Where could this take you?



I am a **camera man**. I use my knowledge of performance and choreography to ensure I take the best shots and my angles highlight the best features of the performance.

Challenge Activities

[Stick it to the man](#)

[School of rock trailer.](#)

[School of rock worksheet](#)

Topic Links

This topic links to:

- Drama - Performance skills
- PE - Physical skills
- English - Understanding terminology and verbs.
- Maths - Problem solving.

Additional Resources

To further practise and develop your knowledge see:

- <https://www.onedanceuk.org/>

- develop knowledge of what Drama Elements mean.
- develop drama technique and skills.
- Identify and perform drama

Keyword	
Storytelling	Gesture
Still image	Projection
Narration	Performance
Body Language	Volume
Facial expression	Timing
Characterisation	Pause
Space	Pace
Levels	Posture
Improvisation	Hot-Seating

Key Concepts

Thinking Questions

- How am I showing my character?
- What is my body language?
- How is it different to my normal?
- What is my character feeling?
- Do my facial expressions match this?
- What is my posture like?
- How do I walk? What is my gait like?
- How do I react to the other characters?
- How close do I stand next to others

Techniques:

Projection (Speaking loud enough for the audience to hear you)

Characterisation (Making and being in character that is different to yourself)

Posture (How you stand and how that is different to you normally)

Narration (Used in the art of storytelling. Its purpose is to tell stories. Narration can be factual or fictional)

A good devised performance ...

Will have a range of different believable characters. It will use a set scenario or one you have made up. The audience will be able to understand what is happening and will be engaged by the action and the storyline.

STORYTELLING DRAMA

You will be developing your knowledge and understanding of DRAMA, STORYTELLING, DEVISING and CHARACTERISATION. These are key drama skills that you will need. We will be creating MYTHICAL characters and creating improvised performances where good characters overpower evil forces to right wrongs.

Assessment

You will take part in several peer and self assessment tasks over the project, as well as your teacher assessment. receiving feedback from your teacher.

Your assessment for this Topic will be based on creating characters and devising performances, before evaluating them.



- develop knowledge of what Drama Elements mean.
- develop drama technique and skills.
- Identify and perform drama

Career Focus - Where could this take you?



I am a Physical theatre performer. Knowledge of different movement traditions, such as mime and clowning is very important. Being able to utilize your facial expressions, body language, posture, spatial awareness, and physicality to tell a story is key to engaging the audience.

Challenge Activities



Write a short 50-100 word description of a lesson or Drama activity you are doing in school. Are you learning a new skill? What is it? How will you learn this skill? Or are you developing a skill you already have to make it better? Which one? How?

Prove that you took part in this activity. You could film yourself doing a version at home, or write up a step-by-step list of all of the things you did.

Write 200 words which explain what you have learnt by taking part in and doing the lesson and how your interests, knowledge and skills have developed. Be specific about your skills.

Topic Links



Dance
Music
English
History

Additional Resources



If you want to do more and extend yourself in Drama...Explore the Arts as a participant

Watch to learn more about tableau/still-image

<https://youtu.be/YfNmIY1-t5k>

Dramatic Elements

Role & Character

Require actors to identify and portray a person's values, attitudes, intentions and actions. Role focuses on type and stereotype while characters are detailed and specific.

Tension

A sense of anticipation or conflict within characters or character relationships. Problems, surprises and mystery in stories to further the dramatic action and create audience engagement.

Situation

Situation refers to the circumstances the characters are in - the who, what, where, when and what is at stake of the roles/characters.

Language

The choice of linguistic expression and ideas in drama used to create dramatic action. This includes the vocal skills.

Mood & Atmosphere

Mood is the feeling or atmosphere that is created by, and emerges through, the dramatic action.

An atmosphere is a surrounding environment or influence.

Relationship

The connections and interactions between people.

Focus

Focus requires you to concentrate the attention on a spatial direction or a point in the space or to direct and intensify attention and frame moments of dramatic action.

Time & Place

Time refers to the fictional time in the story or setting.

Place refers to the fictional place in the story or setting that the action occurs in.

Movement

Movement refers to the physical way in which a character or object transitions through a provided space. It can also refer to stillness. This includes the physical skills.

Symbols

Symbols are what the drama makes you understand. They sum up the meaning of the play, sometimes even on a subconscious level.

Dramatic Action

- to be able to name the key nutrients, sources and functions
- to acquire and demonstrate a range of food skills and techniques
- to be able to acquire and demonstrate the principles of food hygiene and safety

- to be able to identify how and why people make different food and drink choices
- to acquire and apply a knowledge and understanding of food science;

Keyword	Definition
Weighing scales	A tool used to accurately measure the weight/mass of ingredients
Knife	A sharp tool used for cutting food. Different types of knives have different uses, e.g. bread knife, fish knife
Chopping board	Board used for cutting food on to protect work surfaces. Generally made from glass, plastic or wood
Saucepan	A larger pan used for boiling water or making sauces
Wooden spoon	Used for stirring hot food as the material insulates the heat well
Tablespoon	A measure of 15 millilitres
Teaspoon	A measure of 5 millilitres
Dessert spoon	A spoon midway in size between a teaspoon and a tablespoon
Grater	A metal tool used for grating food into much smaller pieces
Baking tray	A metal or Pyrex tray used in the oven to cook food on
Cooling rack	A wire rack used to cool food, often baking
Peeler	Tool used for removing the skin/peel from a food item, usually a fruit or vegetable
Spatula	A broad, flat tool used for mixing or spreading
Nutrient	a substance that provides nourishment essential for the maintenance of life and for growth.
Healthy	in a good physical or mental condition; in good health.

Key Concepts

Food skill	Food skill	Food skill
Bake	Fry and sauté	Portion / divide
Beat	Glaze and coat	Prove
Blitz, puree and blend	Grate	Roast
Casserole	Grill	Roll-out
Chill	Juice	Rub-in

Core	Knead	Sift
Cream	Layer	Snip
Crush	Mash	Spread
Cut out	Measure	Stir-try
Cut, chop, slice, dice and trim	Melt, simmer and boil	Weigh
Decorate and garnish	Microwave	Whisk
Drain	Mix, stir and combine	Zest



The 4C's Concept

By practicing the four Cs of food hygiene **cross-contamination, cleaning, cooking and chilling** those working with food can avoid food poisoning and other illnesses.

COOKING CONVERSION CHART

Measurement

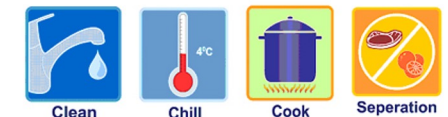
CUP	ONCES	MILLILITERS	TABLESPOONS
8 cup	64 oz	1895 ml	128
6 cup	48 oz	1420 ml	96
5 cup	40 oz	1180 ml	80
4 cup	32 oz	960 ml	64
2 cup	16 oz	480 ml	32
1 cup	8 oz	240 ml	16
3/4 cup	6 oz	177 ml	12
2/3 cup	5 oz	158 ml	11
1/2 cup	4 oz	118 ml	8
3/8 cup	3 oz	90 ml	6
1/3 cup	2.5 oz	79 ml	5.5
1/4 cup	2 oz	59 ml	4
1/8 cup	1 oz	30 ml	3
1/16 cup	1/2 oz	15 ml	1

Temperature

FAHRENHEIT	CELSIUS
100 °F	37 °C
150 °F	65 °C
200 °F	93 °C
250 °F	121 °C
300 °F	150 °C
325 °F	160 °C
350 °F	180 °C
375 °F	190 °C
400 °F	200 °C
425 °F	220 °C
450 °F	230 °C
500 °F	260 °C
525 °F	274 °C
550 °F	288 °C


Weight

IMPERIAL	METRIC
1/2 oz	15 g
1 oz	29 g
2 oz	57 g
3 oz	85 g
4 oz	113 g
5 oz	141 g
6 oz	170 g
8 oz	227 g
10 oz	283 g
12 oz	340 g
13 oz	369 g
14 oz	397 g
15 oz	425 g
1 lb	453 g




- to be able to name the key nutrients, sources and functions
- to acquire and demonstrate a range of food skills and techniques
- to be able to acquire and demonstrate the principles of food hygiene and safety

- to be able to identify how and why people make different food and drink choices
- to acquire and apply a knowledge and understanding of food science;

Retrieval Practice 	
Questions	Answers
What are 8 tips for healthy eating?	<p>Base your meals on higher fibre starchy carbohydrates. Eat lots of fruit and veg. Eat more fish, including a portion of oily fish. Cut down on saturated fat and sugar. Eat less salt: no more than 6g a day for adults. Get active and be a healthy weight. Do not get thirsty. Do not skip breakfast</p>
Why is weighing and measuring important?	<p>Weighing and Measuring For good results in most recipes, accurate weighing and measuring is essential.</p> <p>When you are baking with flour, sugar and liquids, you must measure accurately or your cooking will be spoiled. If you weigh out too much sugar or too little raising agent, your cakes would not rise or you could spoil the taste and/or texture.</p> <p>Food can be weighed in Grams (g) and there are 1000g in a Kilogram (kg). Liquid is measured in Millilitres (ml) or litres</p>
What are the most important health and safety and personal hygiene rules?	<p>Be aware of sharp equipment such as knives, peelers and graters- store them carefully and use the bridge hold and claw grip when chopping. Take care with hot equipment and food/ liquids- turn pan handles in, always use oven gloves and avoid splashes when stirring or draining foods. Wipe up spills quickly so you do not slip over Be aware of others in the kitchen Report any accidents to the teacher Tie hair back Wash your hands</p>

Career Focus - Where could this take you?



My job is **food technologist** and I study foods and their nutritional content. I use laboratory skills and techniques to identify nutrients and calorie content of foods.


Challenge Activities



Try some of these recipes at home
Follow the links
[Energy Bar](#)
[Home made burgers](#)
[Chapatti recipe](#)
[For Further 30 minute recipes](#)

Food skills are acquired, developed and secured over time

Bridge hold

Claw grip



Topic Links 	Additional Resources 
<p>This topic links to:</p> <ul style="list-style-type: none"> • English - relating explicitly to known vocabulary and understanding it with the help of context • Mathematics - use standard units of mass, length, time, other measures • Science: Nutrition and digestion RSE - What constitutes a healthy diet • Physical health and fitness - The characteristics and mental and physical benefits of an active lifestyle. 	<p>To further practise and develop you knowledge see:</p> <p>Eat well guide Quiz</p> <p>Eat well guide</p> <p>Eat well video resource</p>

The aims of the sequence of learning are to ensure that all students:

- Learn the basics of health & safety in the kitchen
- Learn how to recognise and categorise fruit and vegetables
- Be able to select and prepare (including chop safely) vegetables

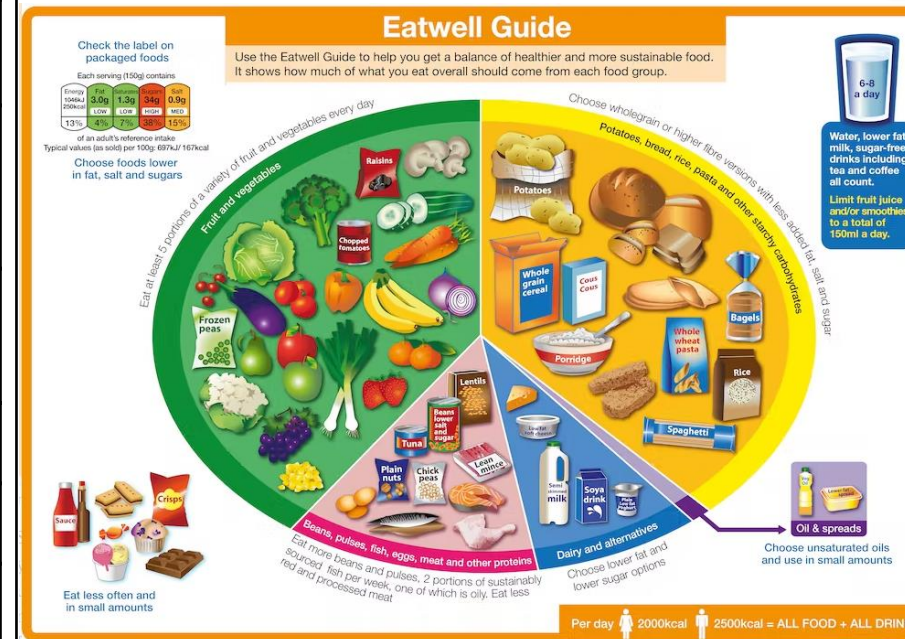
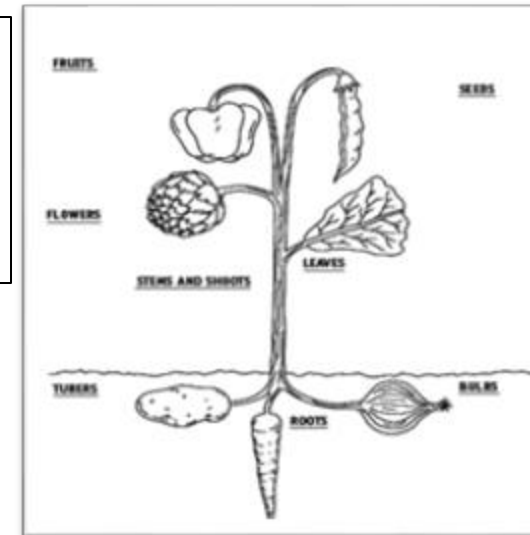
- Learn how to cook pasta, rice and noodles
- Learn the difference between healthy and unhealthy food and the importance of nutrients
- To be able to prepare, cook and present a healthy hot meal

Keyword	Definition
Weighing scales	A tool used to accurately measure the weight/mass of ingredients
Knife	A sharp tool used for cutting food. Different types of knives have different uses, e.g. bread knife, fish knife
Chopping board	Board used for cutting food on to protect work surfaces. Generally made from glass, plastic or wood
Saucepan	A larger pan used for boiling water or making sauces
Frying pan	A frying pan is a flat-bottomed pan used for frying or sautéing food
Grater	A metal tool used for grating food into much smaller pieces
Baking tray	A metal or Pyrex tray used in the oven to cook food on
Cooling rack	A wire rack used to cool food, often baked products
Carbohydrate	Carbohydrates provide energy for the body. The body breaks carbohydrates down into glucose, which is the primary energy source for the brain and muscles.
Protein	Protein is one of the three nutrients found in food that the body needs in large amounts. It is essential for the maintenance and building of body tissues and muscle.
Fibre	Fibre is a type of carbohydrate that the body cannot break down and so it passes through our gut into our large intestine (or colon). It is found naturally in plant foods like wholegrains, beans, nuts, fruit and vegetables and is sometimes added to foods or drinks. Fibre helps to keep our digestive system healthy and helps to prevent constipation.
Fat	The body uses fat as a fuel source. It is the major storage form of energy in the body. Fat also has many other important functions in the body, and a moderate amount is needed in the diet for good health. Too much fat or too much of the wrong type of fat can be unhealthy.
Cross-contamination	Cross-contamination is the physical movement or transfer of harmful bacteria from one person, object or place to another.
Nutrient	A substance that provides nourishment essential for the maintenance of life and for growth, e.g. calcium, iron etc
Healthy	In a good physical or mental condition; in good health.

Key Concepts


The 4Cs Concept

By practicing the four Cs of food hygiene **cross-contamination, cleaning, cooking and chilling** those working with food can avoid food poisoning and other illnesses.




- Learn the basics of health & safety in the kitchen
- Learn how to recognise and categorise fruit and vegetables
- Be able to select and prepare (including chop safely) vegetables

- Learn the difference between healthy and unhealthy food and the importance of nutrients
- To be able to prepare, cook and present a healthy hot meal

Retrieval Practice 	
Questions	Answers
What are 8 tips for healthy eating?	<ul style="list-style-type: none"> • Base your meals on higher fibre starchy carbohydrates. • Eat lots of fruit and veg. • Eat more fish, including a portion of oily fish. • Cut down on saturated fat and sugar. • Eat less salt: no more than 6g a day for adults. • Get active and be a healthy weight. • Do not get thirsty. • Do not skip breakfast
Why is weighing and measuring important?	<p>Weighing and Measuring for good results in most recipes, accurate weighing and measuring is essential.</p> <p>When you are baking with flour, sugar and liquids, you must measure accurately or your cooking will be spoiled. If you weigh out too much sugar or too little raising agent, your cakes will not rise or you could spoil the taste and/or texture.</p> <p>Food can be weighed in Grams (g). 1000g = 1 Kilogram (kg). Liquid is measured in Millilitres (ml) or litres (l). 1000ml = 1 Litre(l)</p>
What are the most important health and safety and personal hygiene rules?	<ul style="list-style-type: none"> • Be aware of sharp equipment such as knives, peelers and graters- store them carefully and use the bridge hold and claw grip when chopping. • Take care with hot equipment and food/ liquids- turn pan handles in, always use oven gloves and avoid splashes when stirring or draining foods. • Wipe up spills quickly so you do not slip over • Be aware of others in the kitchen • Report any accidents to the teacher • Tie hair back • Wash your hands

Career Focus - Where could this take you?



My job is a **food technologist** and I study foods and their nutritional content. I use laboratory skills and techniques to identify nutrients and calorie content of foods. I need a genuine interest in science and how it is applied to food and cookery, high standards of cleanliness and the ability to adhere to strict hygiene rules.

Challenge Activities

Try some of these recipes at home
Follow the links below:

[Energy Bar](#)

[Home made burgers](#)


[Chapatti recipe](#)



[For Further 30 minute recipes](#)

Food skills are acquired, developed and secured over time

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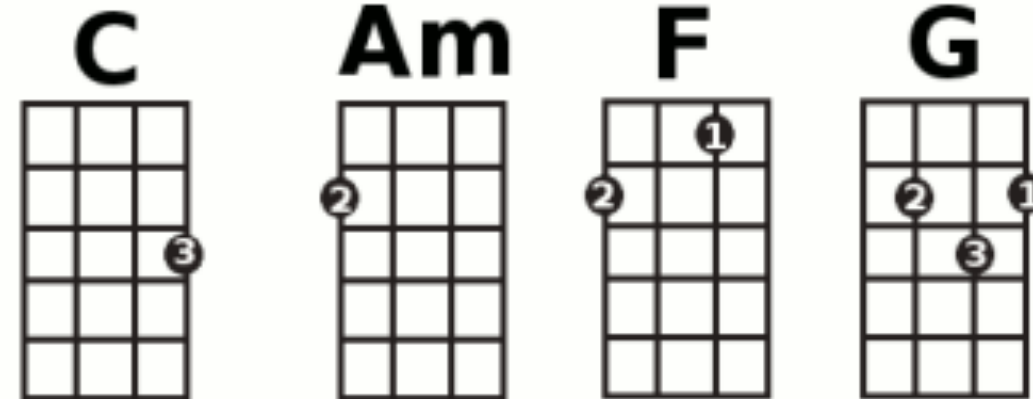
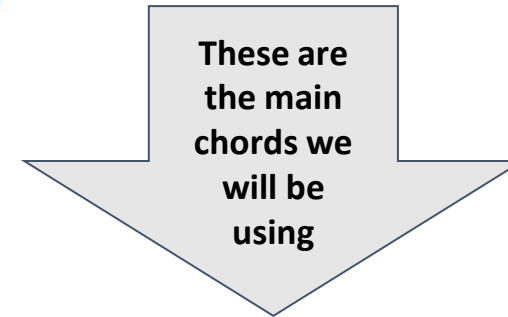
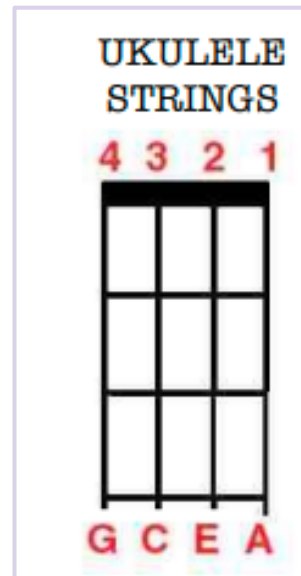
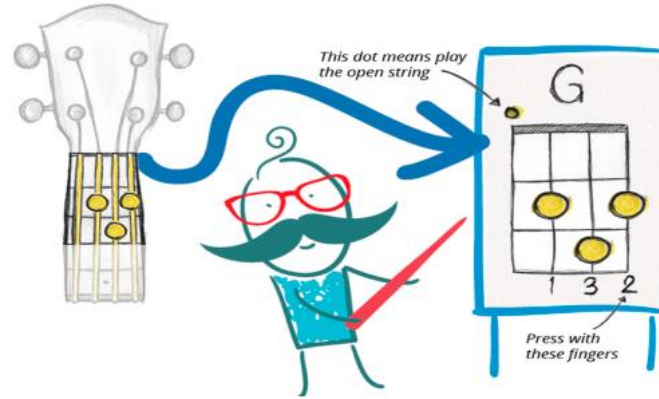


The learning outcomes for this topic are:

- What musical elements are, how and why we use them in music, and how to use them within your singing and playing
- How to play a range of chords on the ukulele, including C, Am, F and G
- How to recognise the musical elements when listening to music and how to use them when playing and singing music
- How to use correct technique when holding and playing the ukulele

Keyword	Definition
Dynamics	How loud or soft the music is and how this changes
Tempo	How fast or slow the music is and how this changes
Texture	The layers within the music - how thick or thin the music is
Pitch	how high or low the music is
Timbre	The tone of the instrument
Attack & Decay	How sounds start and stop - suddenly or gradually
Silence	When no sound is used
Ukulele	The ukulele is a four stringed instrument which looks more or less like a miniature classical guitar.
Strumming	To play all 4 strings by sweeping down with your hand or a plectrum
Picking	To play or 'pick individual strings to create a melody
Technique	The correct way to play the instrument
Chord	Multiple notes played at the same time

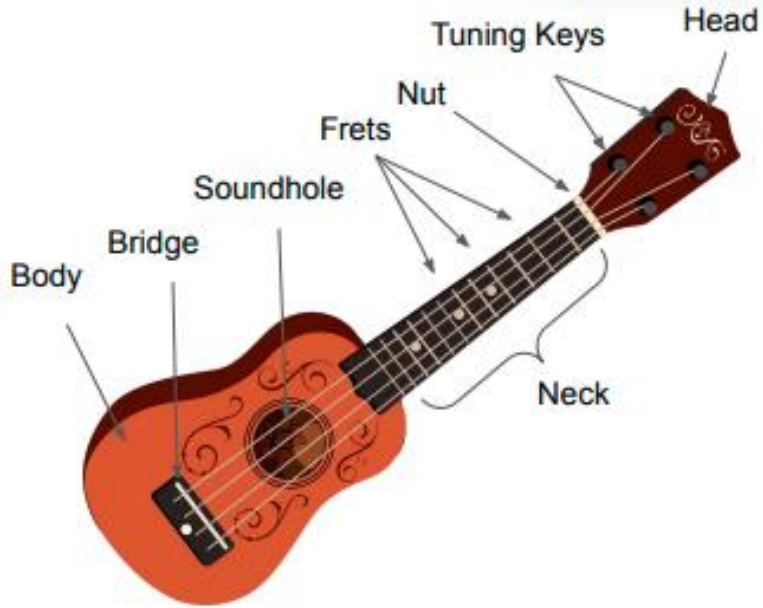
Key Concepts





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STRUMMING SYMBOLS

D = Down
U = Up
X = Tap/Hit

C MAJOR SCALE ON UKULELE

Career Focus - what skills are you learning?



I am a ukulele player and I have to use lots of **skills** to play this instrument. I have to use **coordination** as my left hand is always doing something different to my right. I have to **listen** very carefully so I know what I am playing is correct. This also helps when I am playing in a group and demonstrating good **teamwork**. I also have to **read** the chords as I play. **Coordination** and **teamwork** are skills needed in many other jobs and careers.

Challenge Activities



How well do you know your musical elements? Take this quiz to find out.

[Elements Quiz Link](#)

Here is a more indepth quiz to really test yourself:

[Challenge Elements Quiz](#)

Listen (and watch) the following piece of music by clicking here "[Thunderstorm](#)" a [graphic notation composition by Alex Chorley, age 12](#) and describe the musical elements within it.

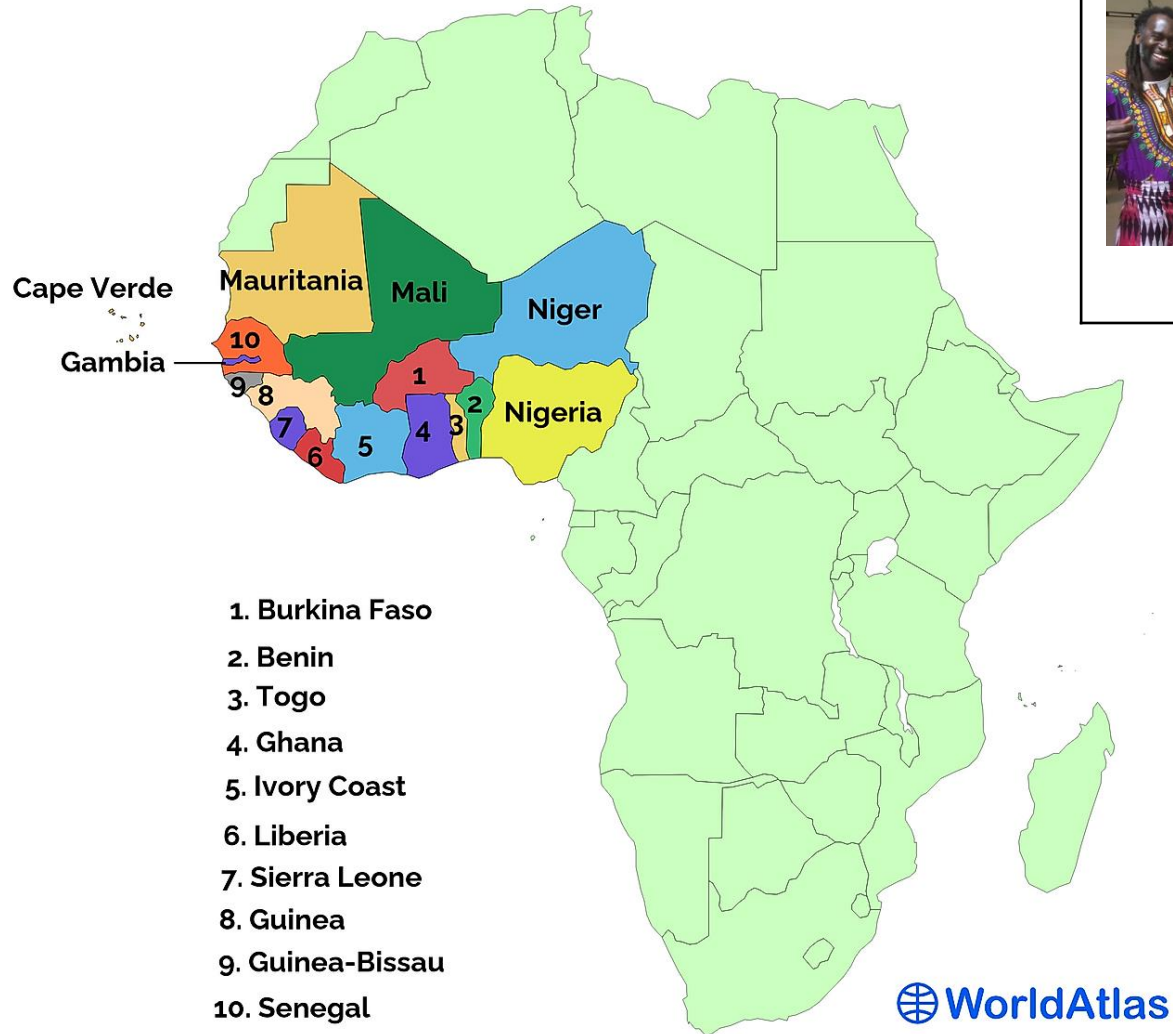
Topic Links	Further Listening
<p>Band Skills Rhythm & Pulse Geography and culture Literacy - keywords and spellings Numeracy - Counting, rhythm, understanding patterns</p>	<p>Ukulele Orchestra of Great Britain George Formby</p>



The learning outcomes for this topic are:

- To understand the importance of rhythm in West African culture
- To be able to play the djembe using correct technique
- To be able to improvise rhythms
- To develop ability to compose in groups

Map of West Africa



Career Focus - Where could this take you?



We are djembe drummers. Group composition requires us to respect the ideas and contributions of others in the group. It also builds teamworking skills as we have to work creatively with other musicians. It is important to learn about music from all over the world to understand different backgrounds and cultures. Tolerance is one of the core British values. Teamwork, creativity and respecting others are important in most jobs and careers

Challenge Activities

1. Here's a rhythm quiz to really test your knowledge:
<https://www.macprovideo.com/course/musictheory103-rhythm/quiz>
2. Here is an online djembe lesson. See if you can learn this rhythm:
https://www.youtube.com/watch?v=jfNs0Z2duPs&ab_channel=DjembeGuru

Further Listening:

- 'Jalikunda African Drums' on YouTube
- 'Kasiva Mutua: How I use the drum to tell my story' on YouTube
- Famoudou Konate - Spotify

Topic Links

This topic links to other music topics such as:

- Rhythm, pulse and tempo
- Group composition
- Performance skills
- Geography and culture
- Literacy – Keywords and spelling
- Oracy – singing/chanting

Additional Resources

To further practise and develop your knowledge see:

BBC Bitesize – Music of Africa:
<https://www.bbc.co.uk/bitesize/guides/zhsny4j/revisio n/1>

Free online djembe lessons and information:
<https://afrodrumming.com/>



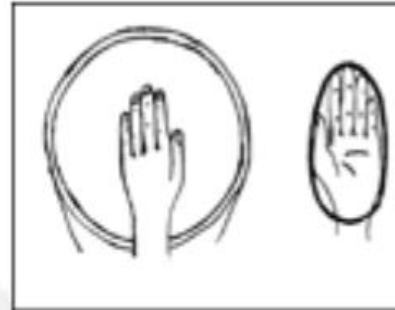
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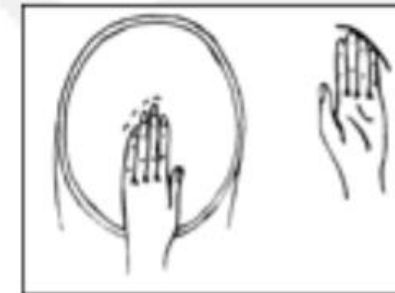
Keyword	Definition
Rhythm	a strong, regular repeated pattern of movement or sound
Dynamics	The volume of a note or sound
Duration	The length of a note or sound
Pulse	A steady beat like a ticking clock or your heartbeat. It can be measured in time by counting the number of beats per minute (BPM).
Tempo	The speed of the pulse.
Ostinato	A short, repeating pattern.
Polyrhythm	When two or more rhythms are being played at the same time.
Improvisation	To make music up in the moment, without planning or rehearsing what you will play.
Imitation Call and Response	One drummer plays a rhythm and the rest of the group repeat it exactly
Master drummer/ griot	The master drummer is the leader of the group. They give the cues and lead the call and response. Griots are the wise leaders and musicians of West African villages.

Key Concepts

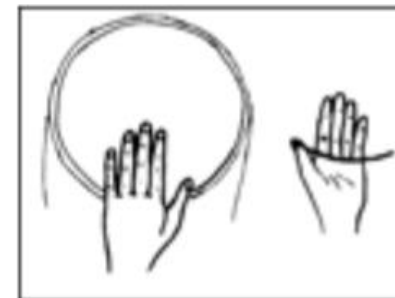
Djembe Hand Techniques



Bass is played in the center of the head with your fingers closed and your hand flat.

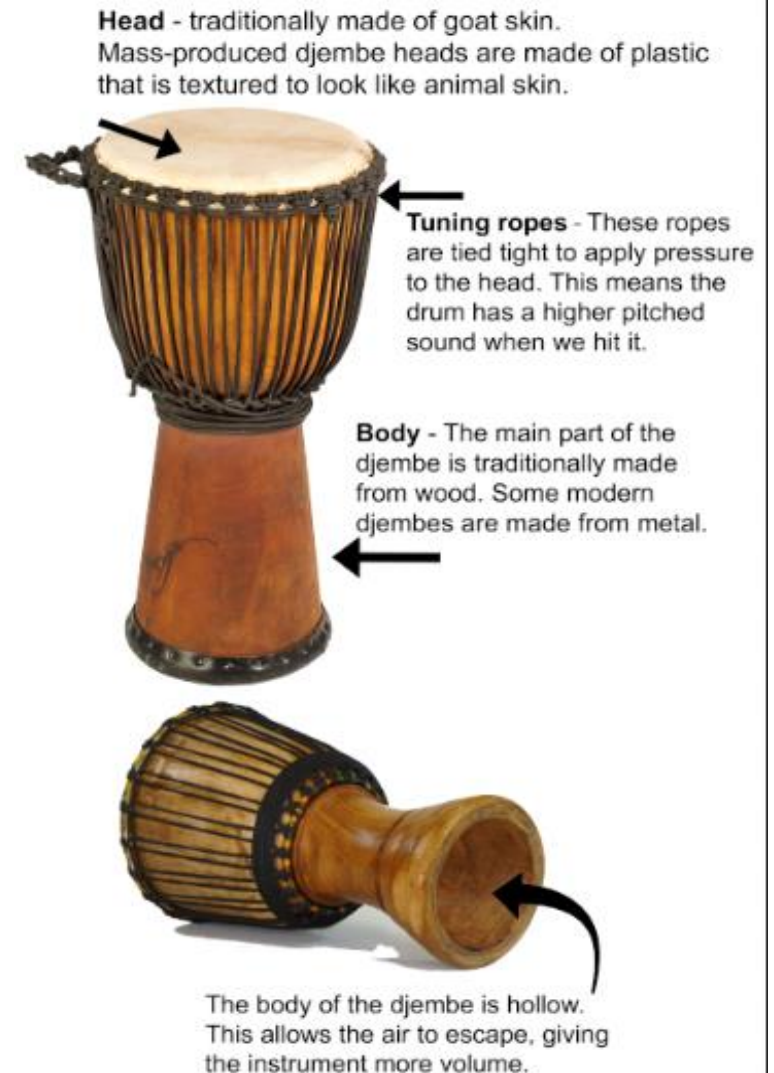


Tone is played on the edge of the djembe with your fingers closed and your hand cupped.



Slap is played near the edge of the head with your fingers open.

Djembe Parts



- Can identify at least three core skills required for net and wall games
- Demonstrate core skills in a practice situation
- Demonstrate core skills in a game situation
- Lead a small group of peers in a skill practice session

Keyword	Definition
Racket	A piece of equipment with a handle, frame and head. This is used to hit the shuttle or ball over the net
Shuttle	A cone shaped object with a cork base. This is hit over the net with the racket.
Net	Rectangular net placed across the court. It divides the court in two.
Court	The playing surface area marked out with lines
Table	The playing surface used to play table tennis
Serve	A shot that is selected to start a game in net and wall activities
Forehand shot	Shot taken with the palm of your hand facing the direction of the stroke

Key Concepts You should already know:- The aim of net and wall games

You will be assessed on:- Understanding - Technique in isolation - Technique in game - Leadership - Attitude to learning

Table Tennis Key Concepts

Ready Position

Players should always be in the ready position before receiving the ball.

- Knees bent
- Feet shoulder width apart
- Feet shoulder width apart
- Racket should be level with the table and in front of body



Forehand Drive

- Ready position
- Controlled backswing, with striking arm opening up extending outwards
- Positive forward movement, arm moves forward and weight transfers from right to left foot
- Strike the ball on top of the bounce
- Follow through the shot, moving upwards and finishes in line with your nose

Backhand serve

- Ready position
- The ball rests in the palm of the resting hand
- Arm moves back towards chest
- Toss the ball up (at least 15cm)
- Forward movement comes from the elbow making contact down on the ball so it bounces on your half of the table first
- Head should be over the ball when making contact
- Follow through by returning to the ready position

Backhand push

- Ready position
- Controlled backswing so your elbow bends inwards towards chest (making an L shape)
- Forward movement comes from the elbow making contact underneath the ball
- Finish by extending your arm in the follow through (changing from an L shape to a I shape)

Badminton Key Concepts



The Basics



The aim of badminton is to hit the shuttle with your racket so that it passes over the net and lands inside your opponent's half of the court. Whenever you do this, you have won a rally; win enough rallies, and you win the match.


Your opponent has the same goal. He will try to reach the shuttle and send it back into your half of the court. You can also win rallies from your opponent's mistakes: if he hits the shuttle into or under the net, or out of court, then you win the rally.

Scoring

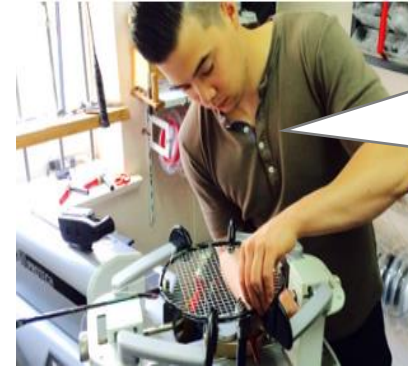
A point is scored when you successfully hit the shuttlecock over the net and land it in your opponent's court before they hit it. A point can also be gained when your opponent hits the shuttlecock into either the net or outside the parameters

To win a game you must reach 21 points before your opponent. If you do so then you will have won that set. If the scores are tied at 20-20 then it comes down to whichever player manages to get two clear points ahead. If the points are still tied at 29-29 then the next point will decide the winner of the set. Winning the overall game will require you to win 2 out of the 3 sets played.

- Can identify at least three core skills required for net and wall games
- Demonstrate core skills in a practice situation
- Demonstrate core skills in a game situation
- Lead a small group of peers in a skill practice session

Retrieval Practice 	
Questions	Answers
What are some of the core skills needed for attacking in badminton.	<ol style="list-style-type: none"> 1. Smash shot is a core skill. The aim is to hit the shuttle as hard as possible to the oppositions side of the court 2. The long serve is a core skill for attacking in badminton. The aim is to send the opponent to the back of the court.
What are some of the core skills needed for defending in badminton.	<ol style="list-style-type: none"> 1. The overhead clear shot is used in a rally situation so that you force your opponent to move to the back of the court. 2. The drop shot is a gentle forehand or backhand shot that applies little force to the shuttle, so it drops just over the net.
What are some of the core skills needed for attacking in table tennis.	<ol style="list-style-type: none"> 1. Top spin forehand drive shot is a fast open palm shot facing the direction of the stroke. By placing top spin on the ball, the balls rotation means it travels faster. 2. Back spin forehand or backhand shot is a skill that is designed to slow down the speed of a rally in table tennis.
What are some of the core skills needed for defending in badminton.	<ol style="list-style-type: none"> 1. Backhand push shot and the forehand push shot are two skills designed to slow down the speed of a rally in a game. This gives the person more time to react to the next shot.

Career Focus - Where could this take you?



I am a professional badminton racket maker. My main job is to repair and re-string professional athletes' rackets. I have to ensure the quality and accuracy with the weight of the racket, balance point, string tension and hand grip.

Challenge Activities

Design a skill card:

This can be used in a PE lesson to help a student to assess their current ability level. Make the skill card to teach the correct way to Serve in either badminton or table tennis.

Create a rules of the game poster:

This can be used by all students in their PE lessons for badminton or table tennis when their role is umpiring a game so that all games can be played fairly, following RITA values. Your poster should have 3-5 basic rules.

Topic Links

This topic links to:

- Science –The role of the cardiovascular system; the physics of sports
- English –understanding and defining key terminology
- Mathematics –problem solving, recording figures and analysing performance and score keeping
- Voice 21 –coaching peers and explaining rules by officiating

Additional Resources

To further practise and develop your knowledge see:

<https://www.badmintonengland.co.uk/>

<https://www.tabletennisengland.co.uk/>

Username and Passwords
