ARENA ACADEMY

Knowledge Organiser Booklet

Year 8

2024-25

1st Half-Term (Spring 1)

Collaboration Opportunity Respect Excellence

DELIVERING A CORE EDUCATION

Subjects

Key Stage 3 (Y7-9):

English
Maths
Science
Geography
History
Religious Education
French
Spanish
Physical Education
Computer Science
Art
Performing Arts
Design Technology
Personal Development

Key Stage 4 (Y10-11):

English
Maths
Art
Business Studies
Religious Education
Food Science
French
Spanish
Geography
Health & Social Care
Combined Science
Triple Science: Biology, Chemistry & Physics
History
Computer Science
Design Technology
Sports Studies
Performing Arts
Psychology
DIT
GCSE PE
Photography
Sociology
Personal Development

What are knowledge organisers?

For students to succeed in a particular area, they must have a foundation of factual knowledge, understand those facts in the context of a conceptual framework and organise knowledge in order to facilitate retrieval and application. We can see knowledge organisers as a way to enable this, in a much more systematic way than traditional revision guides and textbooks.

There are many arguments made for the necessity of the memorisation of important knowledge. Our working memory capacity is limited, so by storing more in our long-term memory, we can free up working memory capacity.

Knowledge organisers are a summary of the key facts and essential knowledge that pupils need about a unit of work or a curriculum subject. Each page contains the essential information broken down into easily digestible chunks. Each single side of A4 is important to focus the minds of the teachers creating them so they only include what's crucial.

Pupils will review, revise and quiz themselves using their knowledge organisers.
Knowledge organisers are a really clear and easy to understand way for parents to be more aware of what their children are learning at school and thus to support them whilst they revise/test themselves at home.

How to use your Knowledge Organiser?

What is a Knowledge Organiser and how will it help me ?
It is an organised collection of knowledge that you need to know and learn for every topic you study in every subject. It will help you to be successful in your tests and exams.
Your teacher will use the knowledge organiser in your lessons. They will ask you to refer to various sections - they might talk this through and/or ask you to make key notes in your books or to highlight certain sections on your knowledge organiser.
Your teacher will set homework, where you will be asked to learn key knowledge from your knowledge organiser - you will then be tested in lessons regularly via short quizzes.

Do I have to bring my Knowledge Organiser every day ?
Yes, you do. It is one of our key expectations that you bring your knowledge organiser to every lesson, every day in your special Knowledge Organiser bag. Your Form Tutor will check this every morning.

Is there anything I could use to support me when using my knowledge organiser ?
Some people find post it's handy to stick onto their knowledge organiser pages - these are useful for extra notes. Small white revision/flash cards are helpful so you can write key facts down. These can then be placed up around the house to help your revision.

How should I use my Knowledge Organiser to help me learn ?
There are lots of ways to use your knowledge organiser - the key to success is to find what works for you. The table below shows you some different ways to use them.

How to use a knowledge organiser – A step by step guide

	Look, Cover, Write, Correct	Definitions to key words	Flash Cards	Self Quizzing	Mind Maps	Paired Retrieval
Step 1	Look at and study a specific area of your knowledge organiser. 	Write down the key words and definitions. 	Use your knowledge organiser to condense and write down key facts and information on your flash cards 	Use your knowledge organiser to create a new quiz. Write down questions using your knowledge organiser. 	Create a mind map with all the information you can remember from your knowledge organiser. 	Ask a partner or family member to have the knowledge organiser or flash cards in their hands 
Step 2	Cover or flip the knowledge organiser over and write down everything you remember. 	Try not to use your knowledge organiser to help you. 	Add pictures to help support. Then self quiz yourself using the flash cards. You can write questions on one side and answers on the other. 	Answer the questions and remember to use full sentences. 	Check your knowledge organiser to see if there were any mistakes with the information you have made. 	They can then test you by asking you questions on different sections of your knowledge organiser 
Step 3	Check what you have written down. Correct any mistakes in green pen and add anything you missed. Repeat. 	Use your green pen to check your work. 	Use a parent/carer or friend to help quiz you on the knowledge. 	You can also use family to help quiz you. Keep self-quizzing until you get all questions correct. 	Try to make connections that links information together. 	Write down your answers. 

What can be found in knowledge organisers?

Some of the core knowledge you can find in your knowledge organiser includes:

- key vocabulary / terminology (tier 3 vocabulary)
- key knowledge that students will require to have memorised for the subject
- key places and people
- useful diagrams (as required for the topic)
- key dates for a subject like history (e.g. when the two World Wars were) would clearly also be included
- key information they should know before starting the topic
- important quotes (that demonstrate those themes)
- important equations
- key academic language (tier 2 vocabulary)

Learn, Cover, Write, Correct

1. LEARN

Choose a small 'chunk' of the page to learn. Read it over and over again in your head.

2. COVER

Cover up the information you have just learnt.

3. WRITE

When the knowledge is covered up, write down the information you studied.

4. CORRECT

Correct your answer, write any missing or incorrect words in red pen.

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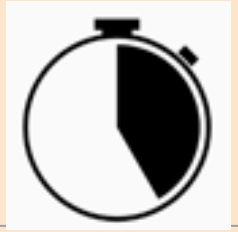
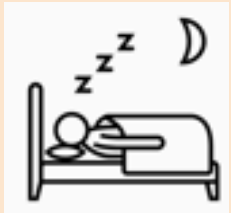
Practice makes Permanent

The Essential Steps for ‘Revising’

Limit distractions 	**Find a nice space to revise in** 	**Create and use a revision timetable. No cramming.** 
Set an alarm and start early 	**Work in intensive blocks of time (25 mins works well)** 	**The more you put in, the more you get out** 
Get plenty of sleep 	**Eat well** 	**Ask your teachers for help** 

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Subject: ..... & Topic: .....

Section 1:	

Section 2:	

Section 3:	

Section 4:

Section 5:	

Mathematics

Topics covered from the beginning of the academy year to the end of this half-term.

SPR 1:

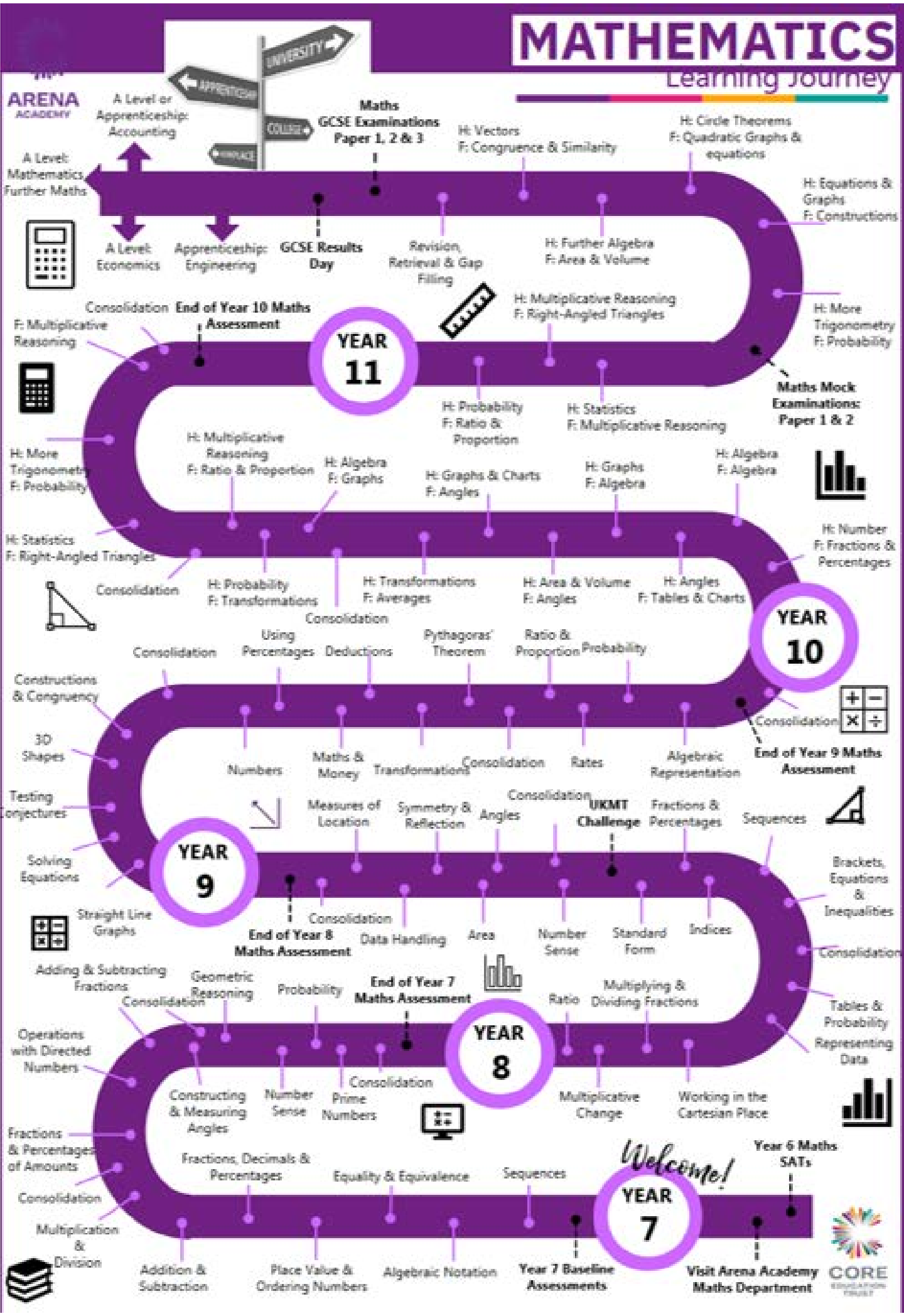
1. Brackets, equations and inequalities.
2. Sequences.
3. Indices.

SPR 2:

1. Fractions and percentages.
2. Standard form.
3. Number sense.

MATHEMATICS

Learning Journey



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MATHS TOPIC 7 – BRACKETS, EQUATIONS AND INEQUALITIES.

Form expressions

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

More than – **ADD**

Less than/ difference – **SUBTRACT**

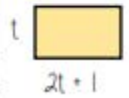
e.g 4 more than t → **t + 4**

8 less than k → **k - 8**

Only similar terms can be grouped together

e.g Find the perimeter of this shape

(Perimeter = length around outside of shape)



t + 2t + 1 + t + 2t + 1 → 6t + 2

Directed numbers

+ + → +

- - → +

+ - → -

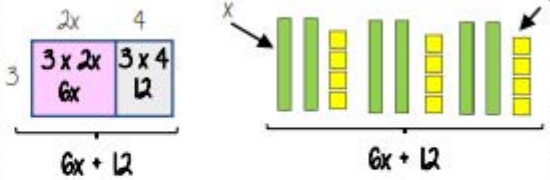
- + → -

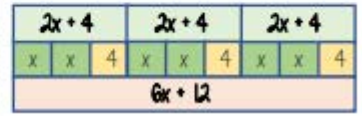
e.g a = -5 and b = 2

$a^2 = a \times a = -5 \times -5 = 25$

b + a = 2 + -5 = **-3**

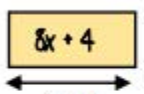
Multiply single brackets 3 (2x + 4)





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

Factorise into a single bracket 8x + 4



Try and make this the **highest common factor**

The two values **multiply** together (also the area) of the rectangle

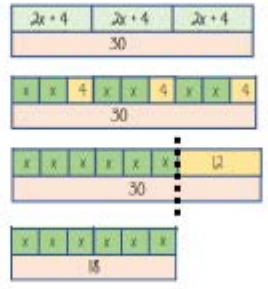
$8x + 4 \equiv 4(2x + 1)$

Note

$8x + 4 \equiv 2(4x + 2)$

This is factorised but the HCF has not been used

Solve equations with brackets 3 (2x + 4) = 30



3 (2x + 4) = 30

Expand the brackets

6x + 12 = 30

- 12 - 12

6x = 18

- 6 - 6

Substitute to check your answer

This could be negative or a fraction or decimal

x
3

x = 3

Simple Inequalities

< less than

≤ Less than or equal to

> More than

≥ More than or equal to

x < 10

Say this out loud

"x is a value less than 10"

10 > x

Say this out loud

"10 is more than the value"

Note

x<10 and 10>x represent the same values

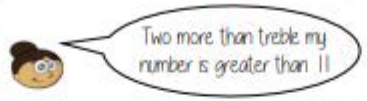
x + 2 ≤ 20

"my value + 2 is less than or equal to 20"

x ≤ 18

The biggest the value can be is 18

Form and solve inequalities



Find the possible range of values

Form

x → x3 → +2 → 11

3x + 2 > 11

Solve

x ← -3 ← -2 ← 11

x > 3

Check

This would suggest any value bigger than 3 satisfies the statement

3 x 3 + 2 = 11 ✓

10 x 3 + 2 = 32 ✓

Algebraic constructs

Expression

A sentence with a minimum of two numbers and one maths operation

Equation

A statement that two things are equal

Term

A single number or variable

Identity

An equation where both sides have variables that cause the same answer includes ≡

Formula

A rule written with all mathematical symbols

e.g area of a rectangle A = b x h

Keywords

Simplify: grouping and combining similar terms

Substitute: replace a variable with a numerical value

Equivalent: something of equal value

Coefficient: a number used to multiply a variable

Product: multiply terms

Highest Common Factor (HCF): the biggest factor (or number that multiples to give a term)

Inequality: an inequality compares who values showing if one is greater than, less than or equal to another

MATHS TOPIC 8 – SEQUENCES.

Linear and Non Linear Sequences

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

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

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

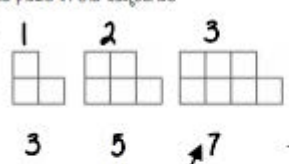
Fibonacci Sequence – look out for this type of sequence

0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms

Sequence in a table and graphically

Position: the place in the sequence



"The **term** in **position** 3 has 7 squares"

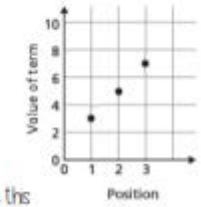
Term: the number or variable
(the number of squares in each image)

In a table

Position	1	2	3
Term	3	5	7

+2 +2

Graphically



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

Sequences from algebraic rules

This is substitution!

$3n + 7$ — This will be linear - note the single power of n. The values increase at a constant rate

$3n^2 + 7$ — This is not linear as there is a power for n

$2n - 5$ → Substitute the number of the term you are looking for in place of 'n'

e.g
1st term = 2 (1) – 5 = -3
2nd term = 2 (2) – 5 = -1
100th term = 2 (100) – 5 = 195

Checking for a term in a sequence

Form an equation

Is 201 in the sequence 3n – 4?

$3n - 4 = 201$ ← Term to check

Algebraic rule

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

Complex algebraic rules

Misconceptions and comparisons

$2n^2$ — 2 times whatever n squared is

$(2n)^2$ — 2 times n then square the answer

e.g
1st term = 2 x 1^2 = 2
2nd term = 2 x 2^2 = 8
100th term = 2 x 100^2 = 2000

e.g
1st term = $(2 \times 1)^2$ = 4
2nd term = $(2 \times 2)^2$ = 16
100th term = $(2 \times 100)^2$ = 40000

$n(n + 5)$ ←

e.g
1st term = 1 (1 + 5) = 6
2nd term = 2 (2 + 5) = 14
100th term = 100 (100 + 5) = 10500

You don't need to expand the expression

H Finding the algebraic rule

This is the 4 times table → 4, 8, 12, 16, 20....

4n

7, 11, 15, 19, 22 ← This has the same constant difference – but is 3 more than the original sequence

4n + 3

This is the constant difference between the terms in the sequence

4n + 3

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

Keywords

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

MATHS TOPIC 9 – INDICES.

Addition/ Subtraction with indices

Coefficient, Power

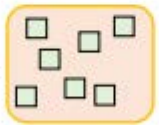
$5x^2 + 4x^4$

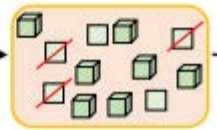
Term, Term

Expression

Each square represents x^2 and each cube represents x^4

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

$5x^2 + 2x^2$ →  → $7x^2$

$5x^2 + 6x^4 - 3x^2 + x^4$ →  → $2x^2 + 7x^4$

Multiply expressions with indices

$4b \times 3a$
$\equiv 4 \times b \times 3 \times a$
$\equiv 4 \times 3 \times b \times a$
$\equiv 12ab$

$5t \times 9t$
$\equiv 5 \times t \times 9 \times t$
$\equiv 5 \times 9 \times t \times t$
$\equiv 45t^2$

$2b^4 \times 3b^2$
$\equiv 2 \times b \times b \times b \times b \times 3 \times b \times b$
$\equiv 2 \times 3 \times b \times b \times b \times b \times b \times b$
$\equiv 6b^6$

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

Addition/ Subtraction laws for indices

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

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

Addition law for indices

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

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

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

Subtraction law for indices

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

Divide expressions with indices

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

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

Cross cancelling factors shows cancels the expression

$\frac{23a^7y^2}{5db^6}$ This expression cannot be divided (cancelled down) because there are no common factors or similar terms

Keywords

Base: The number that gets multiplied by a power
Power: The exponent – or the number that tells you how many times to use the number in multiplication
Exponent: The power – or the number that tells you how many times to use the number in multiplication
Indices: The power or the exponent
Coefficient: The number used to multiply a variable
Simplify: To reduce a power to its lowest term
Product: Multiply

MATHS TOPIC 10 – FRACTIONS AND PERCENTAGES.

Convert FDP

R

$\frac{70}{100}$ → This also means 70 ÷ 100 → 70 out of 100 squares → 70 "hundredths" = 7 "tenths" = 0.7 → 70 hundredths = 70%

Using a calculator: $\frac{\square}{\square}$ → S⇔D → Convert to a decimal

This will give you the answer in the simplest form

× 100 converts to a percentage

Be careful of recurring decimals

e.g. $\frac{1}{3}$ = 0.3333333 = 0.$\dot{3}$

The dot above the 3

Fraction/ Percentage of amount

R

Find $\frac{3}{5}$ of £60

£60 = £12 £12 £12 £12 £12

£36

Remember $\frac{3}{5}$ = 60%

10% of £60 = £6

50% of £60 = £30

60% of £60 = £36

Remember $\frac{3}{5}$ = 60% = 0.6

60% of £60 = 0.6 × 60 = £36

Convert FDP < and > 100%

100 hundredths, 10 tenths = 100%

40 hundredths, 4 tenths = 40%

140 hundredths, 14 tenths = 140%

100% + 40%

1 + 0.40

= 140

Percentage decrease: Multipliers

100%

42%

Decrease by 58%

100% − 58% = 42%

100 − 058 = 042

Multiplier: Less than 1

Percentage increase: Multipliers

100% 12%

Increase by 12%

100% + 12% = 112%

100 + 012 = 112

Multiplier: More than 1

Express as a % - Non-calculator

Percent – per hundred

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

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

Denominator 100 | Equivalent fractions

Express as a % - Calculator

Rosie: $\frac{13}{30}$ → $\frac{\square}{\square}$ → $\frac{13}{30}$ → × 100 → 43.3333...% = 43%

Can't use equivalence easily to find 'per hundred'

This the same as 13 ÷ 30

Decimal percentages are still a percentage

Percentage change

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

100%

£200

£125

All values of change compare to the ORIGINAL value

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

$\frac{\text{Difference in value}}{\text{Original value}} \times 100$

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

100%

£180,000

Percentage profit

Money made (profit value): $\frac{36000}{180000} \times 100 = 20\%$

Choose appropriate method

The language and wording of the question is the key

Have you represented the question in a bar model?

Can you use a calculator?

Keywords

Percent: parts per 100 – written using the / symbol

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

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

Equivalent: of equal value

Reduce: to make smaller in value

Growth: to increase/ to grow

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

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

MATHS TOPIC 11 – STANDARD FORM.

Positive powers of 10

1 billion – 1 000 000 000

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

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

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

Standard form with numbers > 1

$A \times 10^n$

Any number between 1 and less than 10 — Any integer

Example

3.2×10^4

$= 3.2 \times 10 \times 10 \times 10 \times 10$

$= 32000$

Non-example

0.8×10^4

5.3×10^{07}

Negative powers of 10

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

0.001

$1 \times \frac{1}{1000}$

1×10^{-3}

Any value to the power 0 always = 1

Negative powers do not indicate negative solutions

Numbers between 0 and 1

0.054

$= 5.4 \times 10^{-2}$

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

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

Order numbers in standard form

10^{-2}	10^{-1}	10^0	10^1	10^2	10^3	10^4

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

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

Use a place value grid to compare the numbers for ordering

Mental calculations

$6.4 \times 10^2 \times 1000$ **Not in Standard Form**

$= 6.4 \times 10^2 \times 10^3$ **Use addition for indices rule**

$= 6.4 \times 10^5$

$(8 \times 10^5) \times 3$

$= 24 \times 10^5$ **Not in Standard Form**

$= 2.4 \times 10^1 \times 10^5$ **Use addition for indices rule**

$= 2.4 \times 10^6$

$(2 \times 10^5) \div 4$ **Divide the values**

$= (2 \div 4) \times 10^5$

$= 0.5 \times 10^5$

Remember the layout for standard form

$A \times 10^n$

Any number between 1 and less than 10 — Any integer

Addition and Subtraction

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

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

Method 1

$= 600000 + 800000$

$= 1400000$

$= 1.4 \times 10^6$

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

Method 2

$= (6 + 8) \times 10^5$

$= 14 \times 10^5$

$= 1.4 \times 10^1 \times 10^5$

$= 1.4 \times 10^6$

This is not the final answer

Only works if the powers are the same

Multiplication and division

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

$(1.5 \times 10^5) \div (0.3 \times 10^3)$

$(1.5 \div 0.3) \times 10^5 \div 10^3$

$= 5 \times 10^2$

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

Revisit addition and subtraction laws for indices – they are needed for the calculations

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

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

Using a calculator

$1.4 \times 10^5 \times 3.9 \times 10^3$

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

Input 1.4 and press $\times 10^x$ Then press 5 (for the power)

Press $\times$

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

Press $=$

This gives you the solution

Click calculator for video tutorial

To put into standard form and a suitable degree of accuracy

Press SHIFT SETUP and then press 7 for sci mode

Choose a degree of accuracy so in most cases press 2

Answer: 5.5×10^8

Keywords

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

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

Base: The number that gets multiplied by a power

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

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

Indices: The power or the exponent

Negative: A value below zero

MATHS TOPIC 12 – NUMBER SENSE.

Round to powers of 10 and 1 sig figure (R)

If the number is halfway between we "round up"

5495 to the nearest 1000: 5000 ↑ 6000

5475 to the nearest 100: 5400 ↑ 5500

5475 to the nearest 10: 5470 ↑ 5480

370 to 1 significant figure is 400
37 to 1 significant figure is 40
3.7 to 1 significant figure is 4
0.37 to 1 significant figure is 0.4
0.00037 to 1 significant figure is 0.0004

Round to the first non-zero number

Round to decimal places

2.46192

Focus on the numbers **after** the decimal point

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

2.46192 (to 1dp) - Is this closer to 2.4 or 2.5

2.4 6192 This shows the number is closer to 2.5

24 ↑ 25

2.46192 (to 2dp) - Is this closer to 2.46 or 2.47

2.46 192 This shows the number is closer to 2.46

246 ↑ 247

Estimate the calculation

Round to 1 significant figure to estimate

$4.2 + 6.7 \approx 4 + 7 \approx 11$ This is an **overestimate** because the 6.7 was rounded up more

The equal sign changes to show it is an estimation

$21.4 \times 3.1 \approx 20 \times 3 \approx 60$ This is an **underestimate** because both values were rounded down

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

Order of operations (R)

Brackets Operations in brackets are calculated first

Other operations e.g. powers, roots,

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

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

Calculations with money

Debit - You have £0 or more in an account

Credit - You have less than £0 in an account

Money calculations are to 2dp

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

£1.30 + 50p = 1.30 + 50 (in pence)
= 1.30 + 0.50 (in pounds)

£1 = 100p

Units are important: Useful Conversions

mm ⇄ cm ⇄ m ⇄ km: ÷ 10, ÷ 100, ÷ 1000 / × 10, × 100, × 1000

g ⇄ kg: ÷ 1000 / × 1000

ml ⇄ L: ÷ 1000 / × 1000

Time and the calendar

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

12 Months = one year = 52 weeks
31 days – **Jan, March, May, July, Aug, Oct, Dec**
30 days – **April, June, Sept, Nov**
28 days – **Feb** (29 leap year)

1 day – 24 hours
1 hour – 60 minutes
1 minute – 60 seconds

1 week – 7 days:
Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

Use a number line for time calculations!

Analogue Clock

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

Digital Clock (24-hour times)

24-hour clock
- 0-11 (morning hours)
- 12-23 (afternoon hours)

Metric measures of length

Kilo = 1000 x meter Centi = $\frac{1}{100}$ x meter

Milli = $\frac{1}{1000}$ x meter

Units of weight/ capacity

Weight = g, kg, t
Capacity (volume of liquid) = ml, L

Keywords

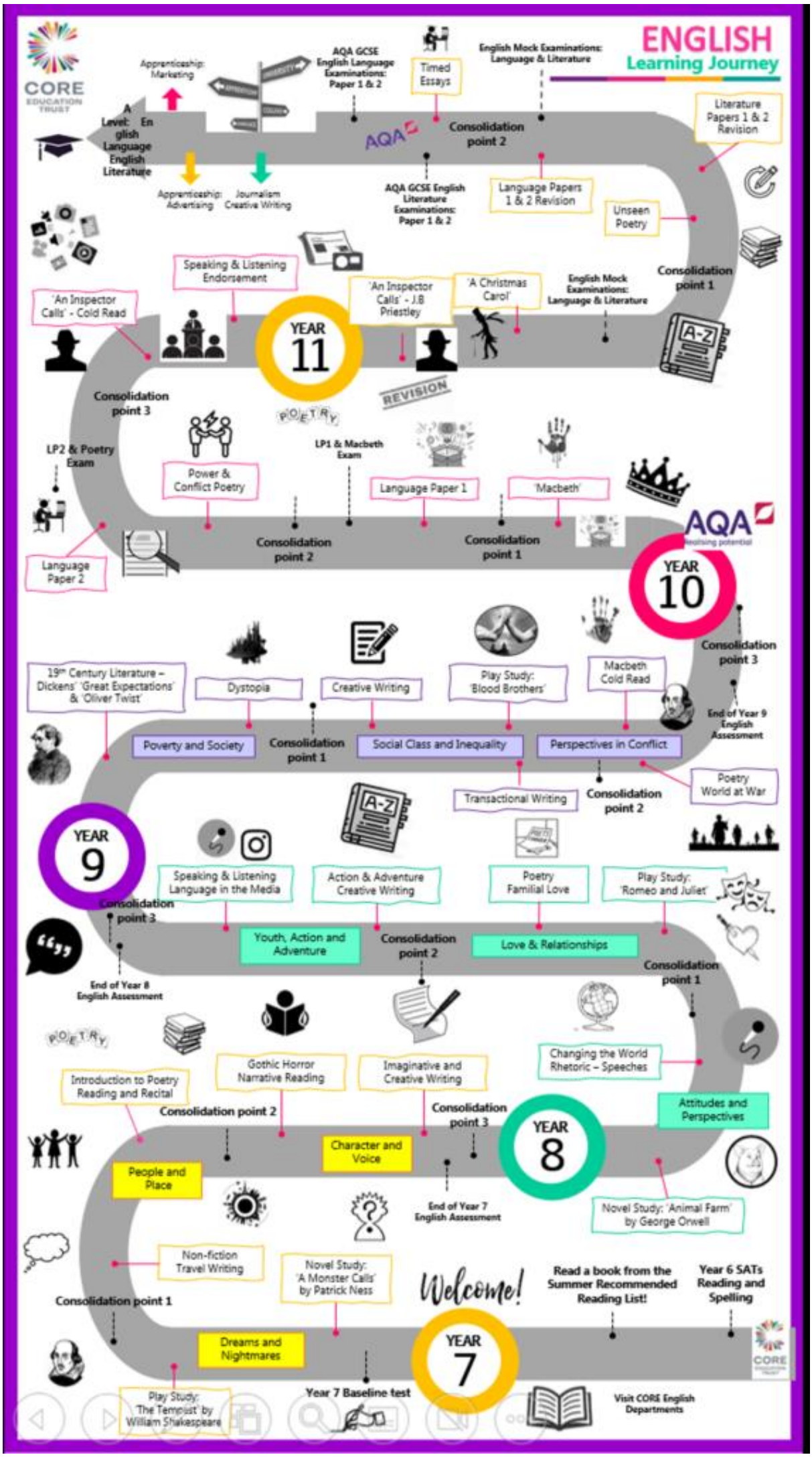
Significant: Place value of importance
Round: Making a number simpler but keeping its value close to what it was
Decimal Place holders after the decimal point
Overestimate: Rounding up – gives a solution higher than the actual value
Underestimate: Rounding down – gives a solution lower than the actual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

English

Topics covered from the beginning of the academy year to the end of this half-term.

Spring:

1. Romeo and Juliet



ARENA ACADEMY

Romeo and Juliet – Knowledge Organiser

Act 1. In Verona, a fight breaks out between Capulet and Montague servants. Benvolio tries to stop the fight, but he is attacked by Tybalt. The Prince threatens the death penalty if either family disturbs the peace again. Meanwhile, Romeo is distraught knowing that his infatuation with Rosaline is not reciprocated. Benvolio consoles him and assures him that he will meet another, more beautiful woman soon. At the Capulets' home, Count Paris asks Lord Capulet for his permission to marry Juliet. Capulet says she is too young, but he encourages Paris to woo her. That evening the Capulets' host a lavish feast. Romeo, Benvolio and Mercutio decide to sneak in wearing masks. Tybalt recognises Romeo, but Lord Capulet asks him to not make a scene as it would ruin the feast. Tybalt stifles his anger and plots revenge. Romeo sees Juliet and instantly falls in love with her. They kiss, but later learn that they belong to rival families.

Act 2. Romeo sneaks back to the Capulets' house and hides under Juliet's window. She declares her love her for him and calls for them to disown their families. Romeo emerges, and they confess their love for each other. However, Juliet is uneasy about the suddenness of their love and says it needs time to grow. She asks Romeo to arrange their marriage if his love is true. The next day, Romeo goes to Friar Lawrence and asks him to marry them. The Friar agrees to perform the marriage ceremony because he thinks it will end the feud between the two families, although he does warn Romeo about the dangers of sudden love. Romeo instructs the Nurse to pass on details about the lovers' secret marriage. Tybalt challenges Romeo to a duel.

Act 3. Tybalt tells Benvolio and Mercutio that he is looking for Romeo. When Romeo appears, he refuses to engage in combat. On his behalf, Mercutio challenges Tybalt to a duel. Mercutio is fatally wounded and dies. In retaliation, Romeo fights with Tybalt and kills him. The Prince banishes Romeo from Verona. Distraught, Romeo visits Friar Lawrence and exclaims that he would rather be dead than be kept away from Juliet. When Juliet learns that Romeo has killed her cousin Tybalt, she feels conflicted. However, as she will soon be Romeo's wife, she has deeper ties to the Montagues now. Romeo climbs into Juliet's bedroom and spends the night with her. The next day, he uses the rope-ladder left by the Nurse and heads to Mantua. Lord Capulet gives permission for Paris to marry Juliet. When Juliet refuses, Lord Capulet is furious and threatens to disown her. Juliet goes to confession so she can see Friar Lawrence and appeal for help.

Act 4. When Juliet arrives at Friar Lawrence's cell, Paris is there. He has been discussing wedding plans. Juliet feels helpless. She says that if the Friar cannot help her, she will kill herself. The Friar gives her a vial (a small bottle) containing a potion which will make her appear dead for forty-two hours. Her family will think she has died. When she wakes up in the family tomb, she'll be able to leave for Mantua to be with Romeo. Juliet returns home and apologises to her father, and plans are made for her wedding to Paris. The next morning, the Nurse finds Juliet "dead". The grieving family arrange for Juliet's body to be moved to the family tomb.

Act 5. Romeo's servant brings the news that Juliet is dead. Romeo decides he must join Juliet in death by poisoning himself. In Verona, Friar John informs Friar Lawrence that he was unable to deliver his important letter to Romeo. Horrified, Friar Lawrence realises he must break into the tomb. Juliet is due to wake up and Romeo will not be there as planned. At the Capulets' tomb, Romeo is caught by Paris. They fight, and Paris is killed. Romeo finds Juliet's body. He drinks the poison, kisses her, and then collapses. Friar Lawrence arrives, but he is too late. Juliet awakens. Realising what has happened, she takes Romeo's dagger and kills herself. Watchmen summon the Prince, who in turn summons the Capulet and Montague households. Lord Montague arrives with the news that Lady Montague has died from a broken heart due to Romeo's exile. When Lord Montague and Lord Capulet learn what has happened, they agree to end their feud and erect golden statues of Romeo and Juliet. The Prince celebrates the end of the conflict but laments the two young lives that had to end to establish peace.

Key characters

Romeo is impulsive, immature and passionate. He is not interested in the violence and conflict that surrounds him.
Juliet is obedient and slightly naive at the start of the play, but she quickly matures and develops wisdom.
Friar Lawrence secretly marries Romeo and Juliet. He wants the warring families to end their feud.
Roseline is unseen in the play, but her role is important: she does not return Romeo's affections, which causes him to find love elsewhere.
Mercutio is a close friend of Romeo. He is witty and sarcastic. He is killed by Tybalt in a duel.
Benvolio is Romeo's cousin who tries to keep the peace.
Tybalt is Juliet's cousin. He spots Romeo at the Capulet feast and vows revenge. He is later killed by Romeo.
Count Paris is a wealthy, respectable nobleman who wants to marry Juliet, eventually winning permission from her father.
The Nurse is Juliet's confidant and mother figure. She provides comic relief, and plays a key role in uniting the lovers.
Lord Capulet loves his daughter and is convinced he knows what is best for her. His wife, **Lady Capulet,** thinks her daughter should marry Paris. She also married young.
Prince Escalus is Prince of Verona. He wants to keep order between the warring families.

Key themes

Love
Fate
Violence & conflict
Language & wordplay
Marriage
Family
Romantic love
Gender
Pride
Mortality
Youth
Exile
Honour

Historical context

Romeo and Juliet was not entirely Shakespeare's invention: the story was brought to an English-speaking audience by the poet Arthur Brooks. Shakespeare often appropriated stories from earlier works.

Act 2, Scene 2 is well-known as the 'balcony scene', but the balcony itself wasn't added until many years later during a revival. In fact, the word 'balcony' didn't appear in the English language until 1618 – two years after Shakespeare's death.

Some people thought the feud between the two families was an allegory for the unrest between Catholics and Protestants. England was a Protestant country at the time, but the play is set in Catholic Italy. How might an Elizabethan audience have viewed Friar Lawrence and his actions?

Add your own examples here:

Stylistic features and relevant terms

Aside
Blank verse
Comic relief
Chorus
Dramatic irony
Figurative language
Foreshadowing
Iambic pentameter
Metaphor
Meter
Monologue
Oxymoron
Personification
Pun
Rhyming couplet
Simile
Soliloquy
Sonnet

Science

Topics covered from the beginning of the academy year to the end of this half-term.

SPR 1:

1. Waves
2. Reactions
3. Bioenergetics

SPR 2:

4. Energy
5. Chemical reactions

Waves

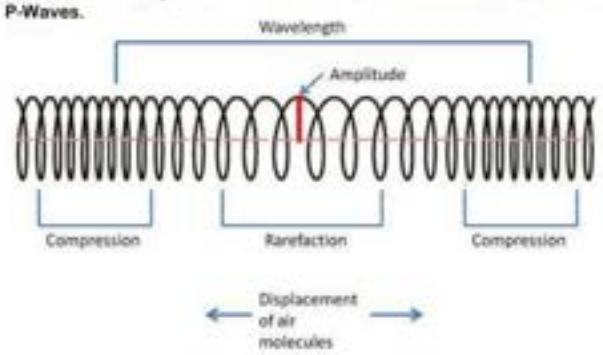
Keyword	Definition
Angle of Incidence	Angle between the normal and incident ray.
Angle of reflection	The angle between the reflected ray and the normal.
Diffuse Scattering	When light is reflected off a surface in all directions.
Dispersion	Spreading out of the different wavelengths of light, caused by refraction of light as it passes through a prism.
Frequency	The number of waves produced each second. The unit of frequency is hertz (Hz).
Amplitude	The maximum height of a wave from the middle of the wave to its peak or trough.
Wavelength	The length of a single wave, measured from one wave peak to the next.
Pitch	The frequency of a sound. Sounds with a high pitch have a high frequency.
Incident Ray	Light ray moving towards a surface or boundary.
Reflected Ray	Light ray leaving a surface or boundary.
Law of reflection	In reflection at a surface, the angle of incidence equals the angle of reflection.
Spectrum	A series of similar waves arranged in order of wavelength or frequency.
Echo	A sound caused by the reflection of a sound wave from a smooth surface back to the listener.

Further Reading:

https://www.bbc.com/bitesize/guides/zq7thyc/revision/1
https://www.bbc.com/bitesize/guides/z8d2mp3/revision/1

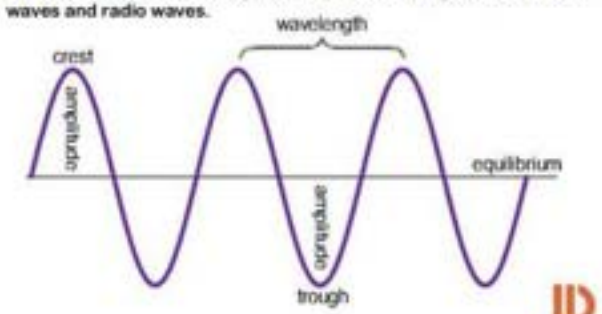
Longitudinal Waves

In longitudinal waves, the vibrations are parallel to the direction of wave travel. Examples are: Sound Waves, Ultrasound Waves, Seismic P-Waves.



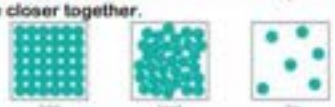
Transverse Waves

In transverse waves, the vibrations are at right angles to the direction of wave travel.
Examples include: Ripples on water, vibrations on a guitar string and a Mexican Wave. Electromagnetic waves such as light waves, micro waves and radio waves.



Speed of Light
300,000km/s
Speed of Sound (air)
343m/s

Light can travel through a vacuum but sound cannot. Sound needs a medium to travel through either a solid, liquid or gas. Sound travels fastest in a solid because the particles are closer together.



Visible Light Wavelengths

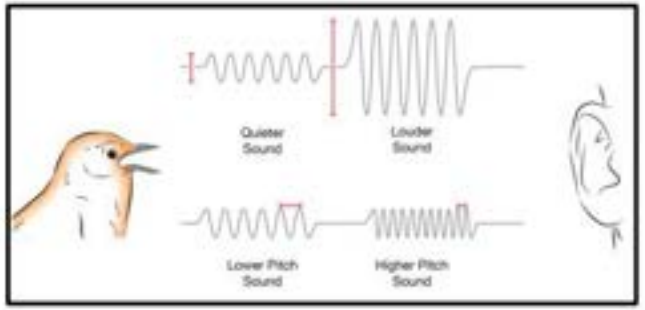
Calculating Wave Speed

$$v = f\lambda$$

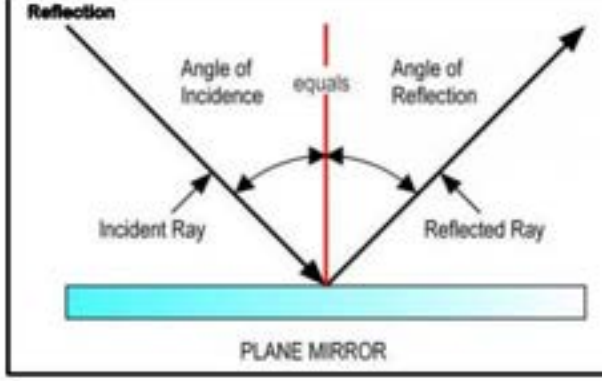
v = velocity
f = frequency
λ = wavelength

Calculating Speed

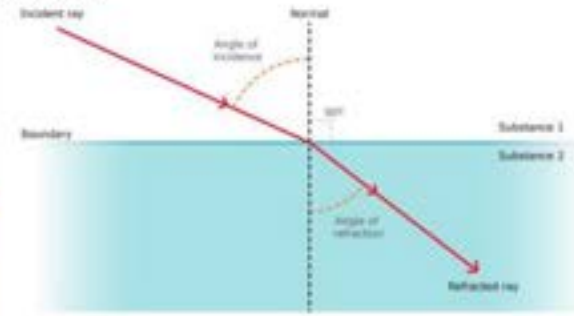
$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$



Reflection



Refraction



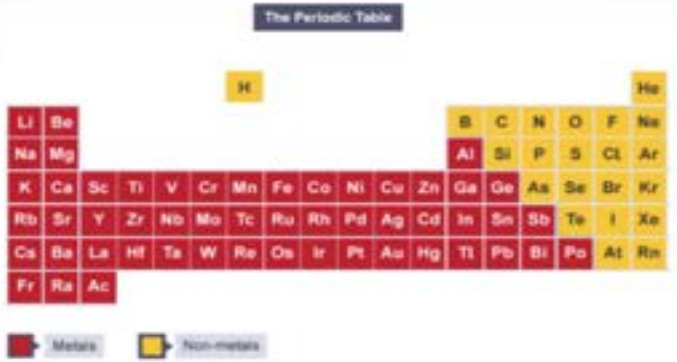
Reactions

Keyword	Definition
Periodic Table	A table of all the known elements in order of their atomic number.
Group	Vertical columns on the periodic table
Period	Horizontal rows on the periodic table
Atom	The smallest piece of an element.
Element	A substance containing only one type of atom.
Compound	Two or more different elements which are chemically joined together.
Mixture	Two or more different elements or compounds which are not chemically joined together.
Chemical Reaction	A process in which one or more substances are changed into others, by their atoms being rearranged. Also known as irreversible reactions.
Physical Reaction	A process in which the physical properties are changed, but no new substances are made. Also known as reversible reactions.
Reactant	A substance that reacts together with another substance to form products during a chemical reaction.
Product	A substance formed in a chemical reaction.
Conservation of Mass	The total mass of the products in a chemical reaction will be the same as the total mass of the reactant.

Further Reading:

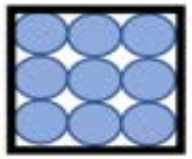
https://www.bbc.co.uk/bitesize/guides/zt2hpv4/revision/1

https://www.bbc.co.uk/bitesize/guides/z84wjxs/revision/1

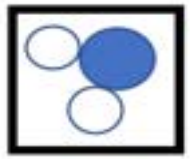


Metals	Non-Metals
Shiny in colour, solids at room temperature (except mercury), high density, strong, malleable, good conductor of heat and electricity.	Dull in colour, can be solids, liquids or gases at room temperature, low density, brittle, poor conductors of heat and electricity.

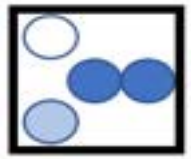
Atoms, Elements, Compounds & Mixtures



This models an element.
There is only one type of atom.



This models a compound.
There are two different elements chemically combined together.



This models a mixture.
There are two or more different elements which are not chemically combined.

Chemical & Physical Reaction

Chemical changes happen when chemical reactions occur. They involve the formation of new chemical elements or compounds.
E.g. Iron will react with oxygen to form Iron Oxide (rust).

Physical changes do not lead to new chemical substances forming. In a physical change, a substance simply changes physical state. E.g. A solid to a liquid.

Chemical Reactions & Equations

The changes in a chemical reaction can be modelled using equations. In general we write:

Reactants → Product

The reactants are shown the left of the arrow, and the products are shown on the right of the arrow. The arrow tells us a chemical reaction has taken place.

E.g.

Iron + Oxygen → Iron Oxide

The iron and oxygen react together (reactants) to produce Iron Oxide (product).

Naming Compounds

Metal + Non-Metal (which contain two elements)

1. The metal always goes first.
2. The ending of the non-metal changes to 'ide'.

E.g.

Copper + Oxygen → Copper Oxide
Lithium + Fluorine → Lithium Fluoride

To name compounds which have a metal, non-metal and oxygen (three or more elements)

1. The metal always goes first.
2. The ending of the non-metal changes to 'ate'.

E.g.

Copper, Sulfur, Oxygen
Copper Sulfate

Conservation of Mass

No atoms are created or destroyed in a chemical reaction. Instead, they just joint together in a different way than they were before the reaction, and form products. This means that the total mass of the products in a chemical reaction will be the same as the total mass of the reactants.

Copper + Oxygen → Copper Oxide
10g 0.5g 10.5g

Balancing Equations

A balanced equation gives more information about a chemical reaction because it gives the symbols and formulae of the substances involved.

$Cu + O_2 \rightarrow CuO$

The above equation is not balanced because there is one copper atom on both sides of the arrow, but two oxygen atoms on the left hand side, and only one on the right.
You need to adjust the number of units of some substances until you have equal numbers of atoms on both sides of the arrow. You cannot change the formulae of a substance (you can't change the small number).

$2Cu + O_2 \rightarrow 2CuO$

Reactions

Keyword	Definition
Periodic Table	A tabular representation of all known elements in order based on atomic number.
Atomic Number	The number of protons in the nucleus of an atom. Also called the proton number.
Periods	A horizontal row in the periodic table.
Groups	A vertical column in the periodic table containing elements with similar chemical properties.
Element	A substance made of only one type of atom.
Compound	A Substance where two or more elements have chemically joined together.
Mixture	Two or more substances that are not joined together. The substances can be elements, compounds or both.
Reactive	The tendency of a substance to undergo a chemical reaction.

Further Reading:
https://www.bbc.com/bitesize/guides/z3vwxnb/revision/5
https://www.bbc.com/bitesize/guides/z84wjxs/revision/1

The periodic table is arranged in rows called periods and columns called groups. Groups contain elements with similar chemical properties.

Group 1 – Alkali Metals

Group 1 metals are very soft metals which can be cut with a knife. They have very low melting and boiling points and are very reactive compared to other metals. The elements become more reactive as you go down group 1.

When the group 1 metals react in water they produce a metal hydroxide and hydrogen gas.
E.g.
Lithium + Water → Lithium Hydroxide + Hydrogen

Group 2 – Alkali Earth Metals

Group 2 metals are reactive, but less reactive than group 1 elements.
Group 2 metals react with acids to produce a salt and hydrogen. The name of the salt depends on the acid used.
Hydrochloric Acid – Chloride
Sulfuric Acid – Sulfate
Nitric Acid - Nitrate
E.g.
Magnesium + Hydrochloric Acid → Magnesium Chloride + Hydrogen
Magnesium + Sulfuric Acid → Magnesium Sulfate + Hydrogen
Magnesium + Nitric Acid → Magnesium Nitrate + Hydrogen

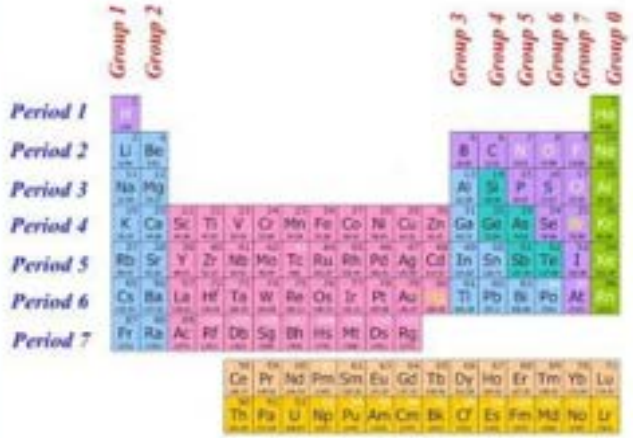
Group 2 metals become more reactive when you go down group 2.

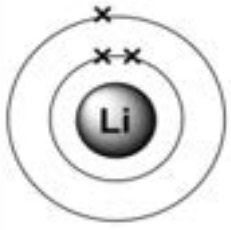
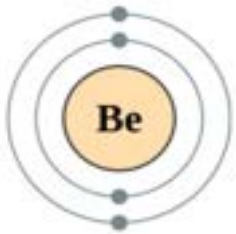
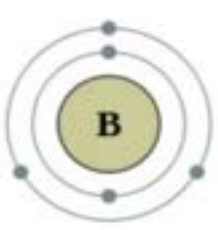
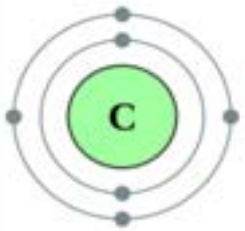
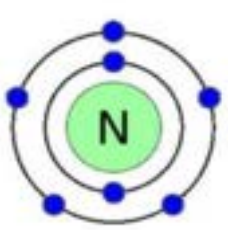
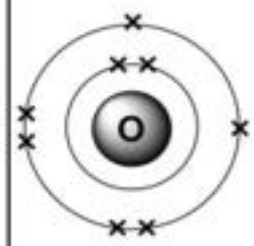
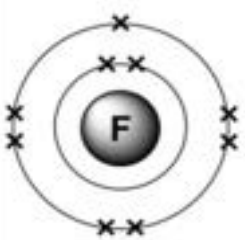
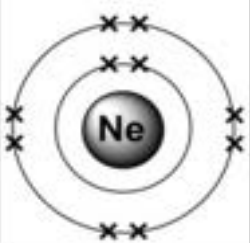
Group 7 – The Halogens

Group 7 elements become less reactive when you move down the group. This can be shown as a displacement reaction.

Group 0 – The Noble Gases

Group 0 elements are not reactive. This is because the atoms have full outer shells.

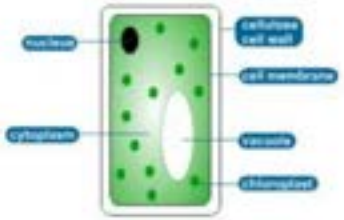


Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
Lithium - Li Sodium - Na Potassium - K	Beryllium – Be Magnesium – Mg Calcium - Ca	Boron – B Aluminium – Al Gallium – Ga	Carbon – C Silicon – Si Germanium – Ge	Nitrogen – N Phosphorus – P Arsenic – As	Oxygen – O Sulfur – S Selenium - S	Fluorine – F Chlorine – Cl Bromine - Br	Helium – He Neon – Ne Argon - Ar
							

Bioenergetics

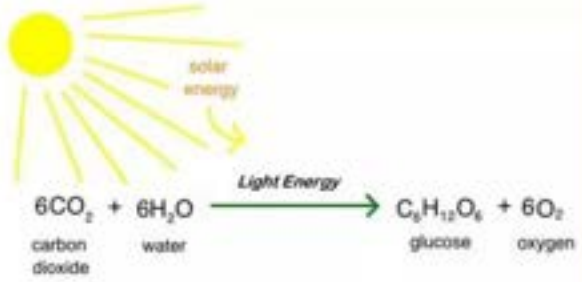
Keyword	Definition
Photosynthesis	Process carried out where plants make their own food. Carbon Dioxide + Water → Glucose + Oxygen
Chlorophyll	Green pigment in chloroplasts of plant cells. It enables photosynthesis to take place.
Chloroplasts	Contain the green pigment chlorophyll; the site of photosynthesis.
Waxy Cuticle	Waxy layer, prevents water loss.
Upper Epidermis	Thin and transparent allowing light to pass through.
Palisade Mesophyll	Main region for photosynthesis. Lots of palisade cells containing lots of chloroplasts.
Spongy Mesophyll	Cells are more loosely packed. Contains air spaces between cells allowing gas exchange.
Lower Epidermis	Contains stomata to regulate the loss of water vapour (transpiration)
Stomata	Each stomata surrounded by a pair of guard cells. Guard cells control whether they're open or closed.
Petals	Brightly coloured to attract insects.
Stamen	The male part of the flower (each consist of an anther held up on a filament)
Stigma	The top of the female part of the flower which attracts pollen.
Anthers	Produce make sex cells (pollen grains)
Ovary	Produces the female sex cells (contained in the ovules)
Nectary	Produce a sugary solution called nectar, which attracts insects.

Green plants and algae do not eat food to get their energy, Instead they make their own food by a process called photosynthesis.
Photosynthesis takes place inside plant cells within the chloroplasts.
Below shows a diagram of a plant cell.



Chloroplasts contain a green pigment called chlorophyll. This absorbs light energy needed for photosynthesis to occur.

Plants use the raw materials; Carbon Dioxide and Water. With the presence of light energy from the sun, the raw materials are converted into Glucose and Oxygen.



This plant is deficient in nitrate ions.
There is poor grown and yellow leaves.
Nitrate ions are needed to build proteins and to help the plant grow.

This plant is deficient in phosphate ions.
Phosphate ions are needed to ensure good root growth.

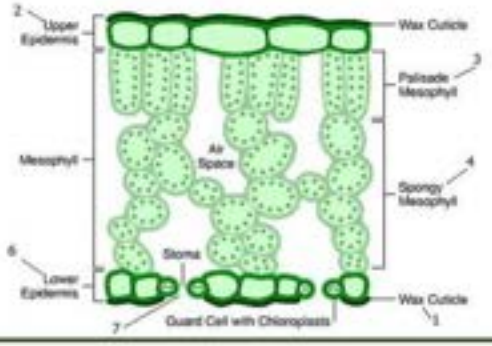
The leaves are starting to turn purple.

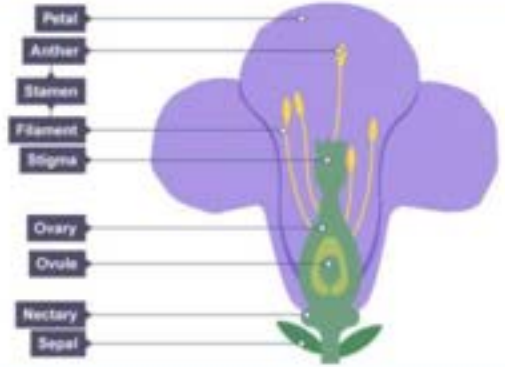
This plant is deficient in Magnesium ions.
Yellow leaves start to form, so rate of photosynthesis is reduced.
Magnesium ions are needed for photosynthesis.

This plant is deficient in Potassium ions.
Potassium ions are needed for making flowers and fruit.

The leaves are turning yellow, with dead spots.

The Leaf Structure





Bioenergetics

Keyword	Definition
Respiration	Process in living things which oxygen is used to release the energy from food. Glucose + Oxygen → Carbon Dioxide + Water (+energy)
Aerobic Respiration	Respiration that requires oxygen.
Anaerobic Respiration	Respiration without oxygen.
Lactic Acid	A chemical produced during anaerobic respiration
Mitochondria	Structures in the cytoplasm of all cells where aerobic respiration takes place.
Oxygen Debt	The amount of extra oxygen required by the body for recovery after vigorous exercise.
Alveoli	Tiny air sacs in the lungs, where gas is exchanged during breathing.
Bronchi	Branches off the trachea that distribute air to both lungs.
Bronchioles	Branches of the bronchi, that distribute the inhaled air throughout all of the lungs.
Diaphragm	Expands and moves down so lungs have room to fill with air – inhalation. Contracts and moves upwards to force air out of the lungs (exhalation).
Lung	Soft organ that inflates to draw in oxygenated air and deflates to expel air.
Trachea	Windpipe, air passes between mouth and lungs.

Aerobic Respiration

Respiration is a series of reactions that takes place in the cells of animals and plants.
Energy is released in the reaction. The mitochondria, found in the cell cytoplasm, is where respiration happens.

Glucose + Oxygen → Carbon Dioxide + Water (+energy)

$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

'Energy' is in brackets because it is not a substance. This type of respiration, where oxygen is used, is known as aerobic respiration. Oxygen (from breathing) is carried from the lungs to all the cells of the body in the blood. The waste products (carbon dioxide and water) are taken away from the cells by the blood and breathed out from the lungs.

Anaerobic Respiration

Although anaerobic respiration does release some energy, it does not release as much as aerobic respiration does.

Glucose → Lactic Acid (+energy)

The lactic acid produced during anaerobic respiration builds up in muscles. This can be felt as an aching in muscles during or after exercise.

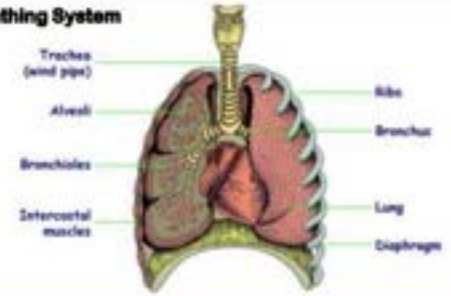
Anaerobic Respiration in Microbes

Anaerobic respiration happens in microorganisms such as bacteria because they need to release energy from glucose. Yeast (unicellular fungi), carry out a process called fermentation.

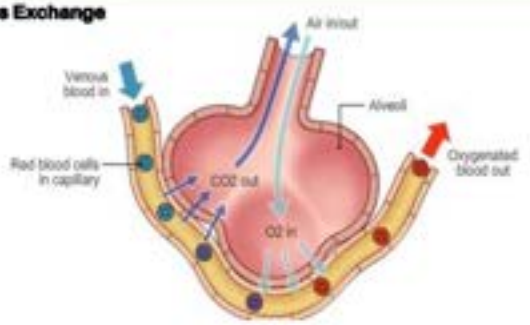
Glucose → Ethanol + Carbon Dioxide

The ethanol (alcohol) is useful for brewers, and carbon dioxide is useful to bakers because it helps their bread rise.

The Breathing System



Gas Exchange



The alveoli are adapted to make gas exchange in the lungs happen easily and efficiently.

- Alveoli give the lungs a large surface area.
- Alveoli have think cells walls (just one cell thick)
- Alveoli are surrounded by lots of blood capillaries.

The gases move by diffusion from where they have a high concentration to a lower concentration.

Oxygen diffuses from the air in the alveoli into the blood.
Carbon dioxide diffuses from the blood into the air in the alveoli.

Asthma and Respiration

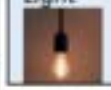
Air passage for people who are asthmatic become reduced.

This is why they often struggle during exercise as there is reduced volume of oxygen getting into the blood stream, so rate of respiration is reduced.

Energy

Keyword	Definition
Energy Transfer	Changes from one form of energy to another form of energy.
Conservation of Energy	Energy cannot be created or destroyed It can be stored, dissipated or transferred from one form into another.
Internal Energy	Energy stored in all materials, including energy due to the motion of particles and the forces between them.
Kinetic Energy	Energy which an object possesses by being in motion.
Elastic Potential Energy	Energy stored in squashed, stretched or twisted materials.
Gravitational Potential Energy	The energy stored by an object lifted up against the force of gravity. Also known as GPE.
Thermal Energy Store	Energy store filled when an object is warmed up.
Work done	Work is done when a force makes an object move a distance, energy is transferred
Power	The rate of work done. Or The energy transferred per second.
Fossil Fuel	Natural, finite fuel formed from the remains of living organisms, e.g. oil, coal and natural gas.
Non-Renewable	A resource that cannot be replaced when it is used up, such as natural gas or cold.
Renewable	An energy resource that will not run out, e.g. solar energy and wind energy

https://www.bbc.com/bitesize/guides/z99jq6f/revision/1
https://www.bbc.com/bitesize/guides/zggk87h/revision/1
https://www.bbc.com/bitesize/guides/zp6jtv4/revision/1

Type of energy	Description	Type of energy	Description
Kinetic 	The energy in moving objects	**Thermal (Internal)** 	The heat stored in an object
Chemical 	When a substance undergoes a chemical reaction	**Gravitational potential** 	When an object is raised to a height
Magnetic 	When 2 objects attract or repel	**Electrostatic (electrical)** 	Allows an electric current to flow
Elastic potential 	When an object is stretched or squashed	**Nuclear** 	Energy stored in an atom*(not needed till GCSE)*
Light 	*From a bright object (not stored)*	*Sound* 	*From a vibrating object (not stored)*

Calculating Kinetic Energy

$$E_K = \frac{1}{2}mv^2$$

E_k = Kinetic Energy
m = Mass
v = velocity

Calculating GPE

GPE = mass x gravitational field strength x height

- Mass is measured in **kilograms** (kg).
- Gravitational field strength is measured in **newtons per kilogram** (N/kg), usually taken as 10N/kg on Earth.
- Height is measured in **metres** (m).
- GPE is measured in **joules** (J).

Calculating Power

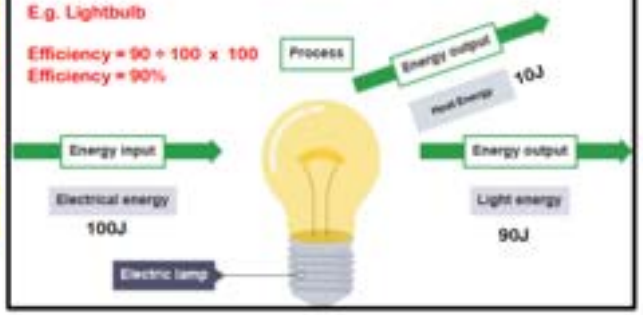
Word Equation	Power = Work Done / Time Taken
Dimensions	P = W / t
Units	Watt = Joule / second

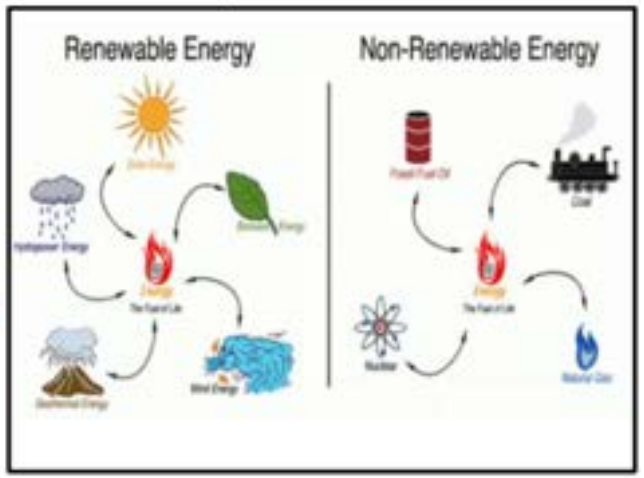
Calculating Efficiency.

Efficiency = useful energy out / total energy in X 100

E.g. Lightbulb

Efficiency = 90 ÷ 100 x 100
Efficiency = 90%





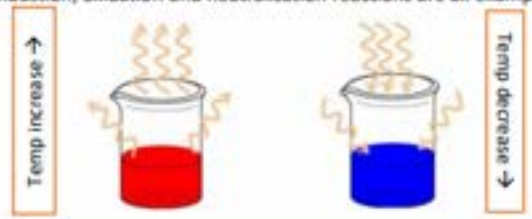
Chemical Reactions

Keyword	Definition
Endothermic	Reactions that take in heat
Exothermic	Reactions that give out heat
Oxidation	Reaction of other elements with oxygen
Combustion	Burning fuel in oxygen
Thermal Decomposition	When a substance is broken down into 2 or more products by heat
Reactivity series	List of metals in order of reactivity
Displacement	A more reactive metal will displace a less reactive metal from its compound
Catalyst	A substance that increases the rate of a reaction but is not itself used up.
Polymer	Long chain molecules made up of many monomers.
Fuel	Contain hydrocarbons – compounds containing hydrogen and carbon atoms only.
Activation Energy	The minimum amount of energy that colliding particles must have for them to react

Further Reading:
https://www.bbc.com/bitesize/guides/zqd2mp3/revision/3
https://www.bbc.com/bitesize/articles/zcwxcj6
https://www.bbc.com/bitesize/guides/zqd2mp3/revision/5
https://www.bbc.com/bitesize/guides/zqd2mp3/revision/6

Endothermic Reactions
In an endothermic reaction, thermal energy is taken in from the surroundings, therefore there is a temperature decrease. Thermal decomposition is an example.

Exothermic Reactions
In an exothermic reaction, thermal energy is given out to the surroundings, therefore there is a temperature increase.
Combustion, oxidation and neutralisation reactions are all examples.



Combustion
Combustion is another name for burning. It is an example of an exothermic reaction. There are two types of combustion – complete combustion and incomplete combustion.

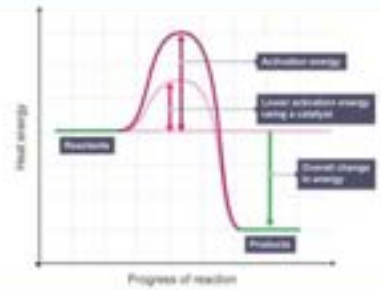
Complete Combustion
Coal, oil and gas are furls. They contain hydrocarbons (compounds of hydrogen and carbon atoms only). When these fuels burn, it reacts with oxygen in the air to produce carbon dioxide and water vapour.
Fuel + Oxygen → Carbon Dioxide + Water

Incomplete Combustion
If there is not enough oxygen in the air for complete combustion, incomplete combustion will happen instead.
This time either carbon monoxide is produced (a toxic gas which can lead to death) or carbon is produced (appears as soot and smoke which can cause breathing problems).
Fuel + Oxygen → Carbon Monoxide + Water
Fuel + Oxygen → Carbon + Water

Catalysts

A catalyst is a substance that:
- Speeds up the rate of a chemical reaction
- Does not alter the products of the reaction
- Is unchanged chemically and in mass at the end of the reaction.

Catalysts provide an alternative reaction pathway that has a lower activation energy than the uncatalysed reaction.



Oxidation Reactions
In an oxidation reaction, a substance gains oxygen. Metals and non-metals can take part in oxidation reactions.

Metals react with oxygen in the air to produce metal oxides. For example, copper reacts with oxygen to produce copper oxide when it is heated in the air.

Copper + Oxygen → Copper Oxide
$2Cu + O_2 \rightarrow 2CuO$

Thermal Decomposition
Some compounds break down when heated, forming two or more products from one reactants.
Many metal carbonates can break down easily when it is heated:
Copper Carbonate → Copper Oxide + Carbon Dioxide

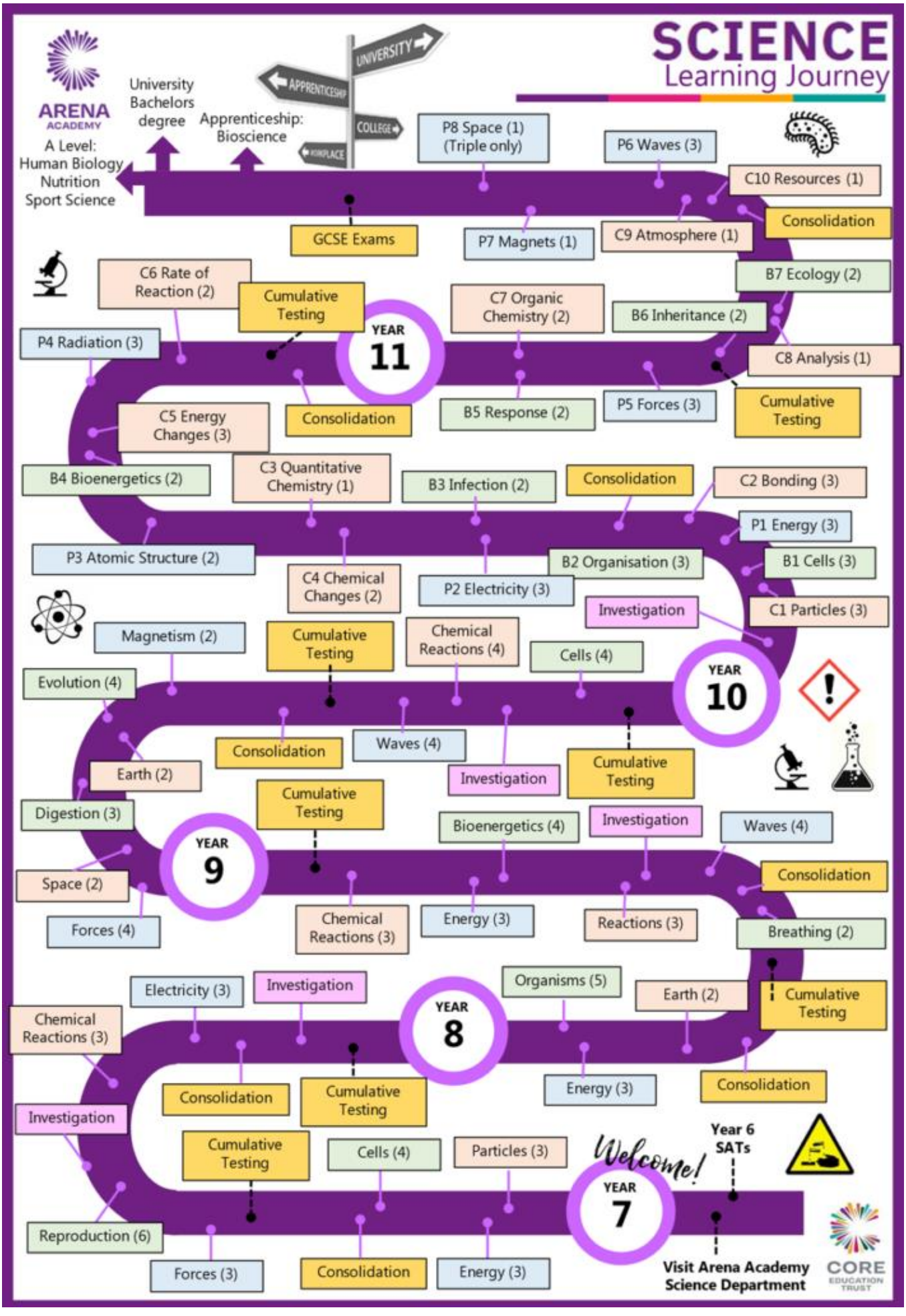
Copper carbonate is green, copper oxide is black. We can test for carbon dioxide using limewater. Limewater is colourless, but turns cloudy when carbon dioxide is bubbled through it.

Reactivity Series

Some metals are very unreactive. This means they don't take part in chemical reactions. For example platinum. Some metals are very reactive and they take part in chemical reactions easily to form new substances.

Displacement Reactions
Displacement reactions involve a metal and a compound of a different metal. In displacement reactions, a more reactive metal will displace a less reactive metal from its compound.
Magnesium + Copper Sulfate → Magnesium Sulfate + Copper

Magnesium is more reactive than copper, so it displaces (pushes out) the copper within the compound.


SCIENCE
Learning Journey
ARENA ACADEMY
University Bachelors degree
Apprenticeship: Bioscience
A Level: Human Biology Nutrition Sport Science
UNIVERSITY
APPRENTICESHIP
COLLEGE
WORKPLACE
GCSE Exams
P8 Space (1) (Triple only)
P7 Magnets (1)
P6 Waves (3)
C9 Atmosphere (1)
C10 Resources (1)
Consolidation
B7 Ecology (2)
B6 Inheritance (2)
C8 Analysis (1)
Cumulative Testing
P5 Forces (3)
B5 Response (2)
C7 Organic Chemistry (2)
C6 Rate of Reaction (2)
Cumulative Testing
Consolidation
P4 Radiation (3)
C5 Energy Changes (3)
B4 Bioenergetics (2)
C3 Quantitative Chemistry (1)
B3 Infection (2)
Consolidation
C2 Bonding (3)
P1 Energy (3)
B1 Cells (3)
C1 Particles (3)
Investigation
Cumulative Testing
P2 Electricity (3)
C4 Chemical Changes (2)
P3 Atomic Structure (2)
Magnetism (2)
Cumulative Testing
Chemical Reactions (4)
Cells (4)
Evolution (4)
Consolidation
Waves (4)
Investigation
Cumulative Testing
Earth (2)
Digestion (3)
Cumulative Testing
Bioenergetics (4)
Investigation
Waves (4)
Consolidation
Space (2)
Forces (4)
Chemical Reactions (3)
Energy (3)
Reactions (3)
Breathing (2)
Cumulative Testing
Electricity (3)
Investigation
Organisms (5)
Earth (2)
Chemical Reactions (3)
Consolidation
Cumulative Testing
Energy (3)
Consolidation
Investigation
Cumulative Testing
Cells (4)
Particles (3)
Reproduction (6)
Forces (3)
Consolidation
Energy (3)
Welcome!
Year 6 SATs
Visit Arena Academy Science Department
YEAR 11
YEAR 10
YEAR 9
YEAR 8
YEAR 7
CORE EDUCATION TRUST

Geography

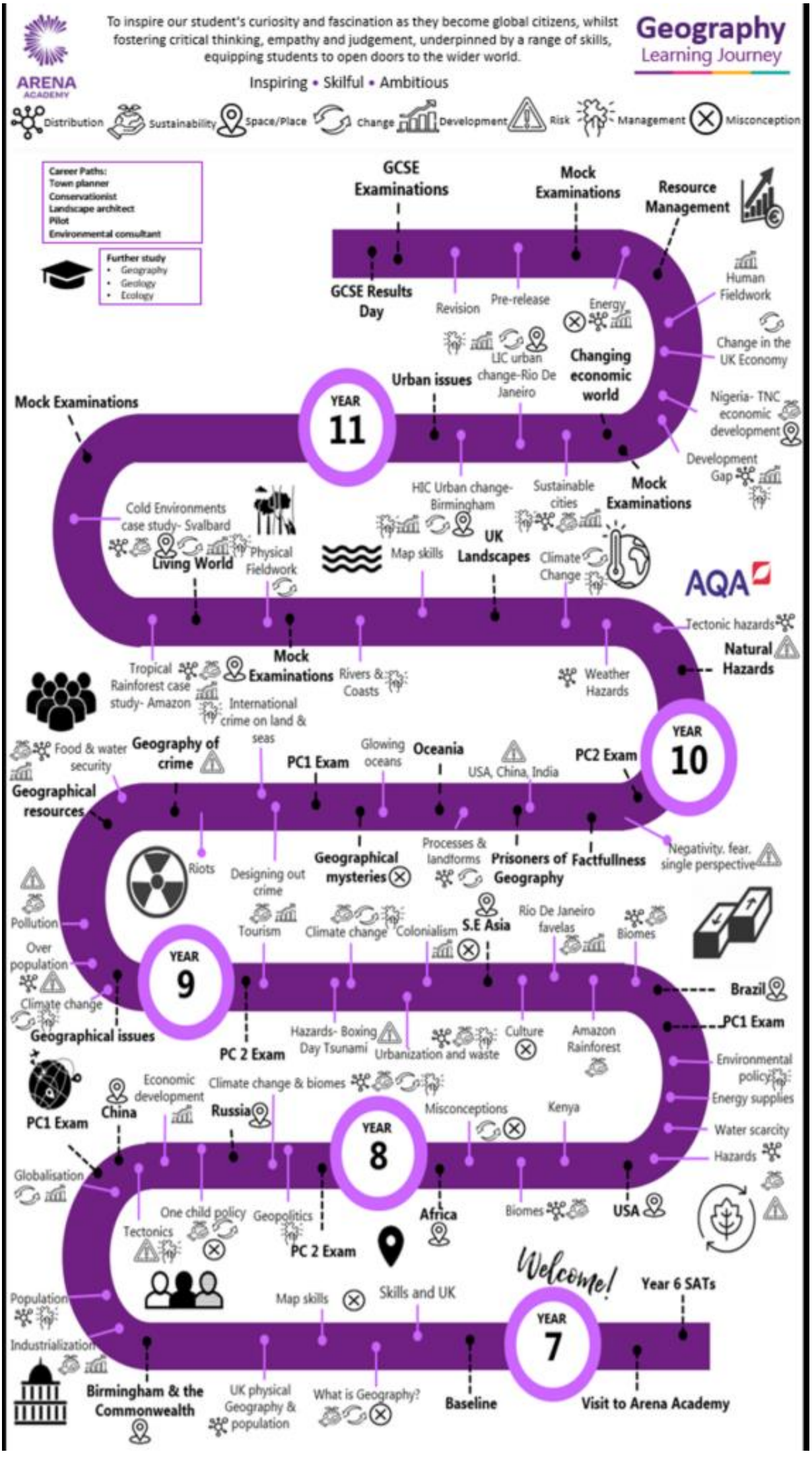
Topics covered from the beginning of the academy year to the end of this half-term.

SPR 1: Africa

1. Misconceptions
2. Biomes & adaptations
3. Population distribution
4. Tribe culture

SPR 2: USA

5. Tectonic hazards
6. weather hazards
7. Biomes and adaptations
7. Geopolitics



ARENA ACADEMY

Year 8 Half Term 1

Units covered: Africa

Key concepts:

Distribution	Change	Interconnection
Place	Scale	Sustainability
Development	Space	Environment

Half-term targets:

- Can I address examples of misconceptions about Africa?
- Can I state the different biomes in Africa and describe their key characteristics?
- Can I describe plant and animal adaptations found in African species?
- Can I describe what colonialism is and how it impacted Africa?
- Can I describe how population pyramids are used and how they can indicate development?
- Can I describe the process of hydroelectric power and its opportunities and challenges?
- Can I describe the location of Kenya and its opportunities and challenges associated with urbanisation, tourism and fairtrade?

Key definitions:

- Misconception: A view or opinion that is formed based on false information and understanding
- Biome: A large-scale ecosystem with similar characteristics such as plants, animals and climate.
- Adaptation: A physical or behavioural change that a plant or animal makes to help its survival.
- Colonialism: The forced full or partial control of one nation over another with the intention of exploiting resources.
- Population pyramid: A type of graph that shows the distribution of age and gender across a population.
- Shanty town: A deprived area on the outskirts of a city made of large settlements made from scrap materials.
- Tourism: The act and process of spending time away in a new destination for pleasure, relaxation and recreation.
- Fairtrade: An international partnership that supports farmers and workers in developing countries with their agricultural practices.

Key information:

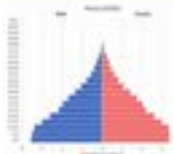
1. Misconceptions about Africa arise from a lack of education and understanding from European nations that dates back to colonialism and discrimination (Africa L2). Examples of misconceptions include that Africa is a country, that it has no food, water or technology or that all Africans live in huts.
2. There are 3 biomes that are found across Africa – the savannah grassland, the desert and the tropical rainforest. All of these have different physical characteristics and species unique to the area.
3. Different plants and animals across Africa have different adaptations that allow them to survive in their biomes. These adaptations can include camouflage, being poisonous, being nocturnal and having a limited diet.
4. The Scramble for Africa happened when 6 different European countries wanted control of Africa's land due to the range of resources available such as diamonds, crops, oil and gold. The impacts were positive and negative such as introducing and education system and the exploitation and slavery of the population.
5. Egypt is an example of a country that is investing in hydroelectric power (power generated from the gravitational potential of flowing water). Hydroelectric power (e.g. the Aswan Dam) has opportunities and challenges such as lengthy construction, high costs, risk assessments, creation of jobs and that it is a renewable energy source.

Example exam questions:

1. Define the term "misconception" and describe one of the common misconceptions about Africa.
2. Define the term "biome" and state an example found in Africa.
3. Explain how plants and animals are adapted to survive in Africa.
4. Explain how colonialism impacted Africa.
5. Describe the opportunities and challenges in a shanty town you have studied.
6. Explain what Fairtrade is and how it supports farmers in developing countries.

Case study summary: Kenya (Lesson 6-11)

6. Kenya is located in both hemispheres in Africa. The capital city is called Nairobi. Kenya has an uneven population distribution due to its environmental conditions but also because of the process of urbanisation. More people want higher skilled and higher paid jobs with better housing and services which are not available in rural areas.
7. Population pyramids show that Kenya has a mostly young population which can indicate facts such as there is a high birth rate, that women are having children young and families are larger than other countries and that healthcare for the elderly is not high quality. There are challenges associated with moving to urban areas such as littering, congestion, lack of housing and pollution which is why shanty towns are constructed.
8. Kibera is a shanty town that is on the outskirts of Kenya's capital Nairobi. Opportunities there include the abundance of childcare available through residents, a strong community spirit and tourist visits to highlight the realities of living in a shanty town. Challenges include unreliable power, poor housing quality, lack of access to services and overcrowding.
9. Maasai Mara is a wildlife reserve in Kenya along the Tanzanian border that is home to a tribe of the same name known for its gender specific roles and traditional cultural aspects such as dress, cuisine and music.
10. Tourism is one of Kenya's most important industries, and has strong linkages with transport, food production, retail and entertainment. Kenya is popular for tourists because there is a diverse range of tourist destinations and products, there is cultural diversity, and the government is supportive of the industry and encourages it to generate as much money as possible to be reinvested into local areas.
11. Fairtrade has helped farmers in Kenya set standards for the production and selling of their crops. Fairtrade has also introduced new farming methods to help farmers with their produce and has ensured that workers have rights and regulations e.g. fair pay, working conditions.



Year 8 Half Term 2

Units covered: USA

Key concepts:

Space	Change
Place	Interconnection
Environment	Distribution

Half-term targets:

- Can I describe the location of the USA?
- Can I define what weather hazards are and describe their impacts?
- Can I define what an earthquake is and give examples of impacts and responses?
- Can I explain the different strategies that can be used to earthquake proof buildings?
- Can I describe the population distribution of the USA?
- Can I describe the causes and impacts of water scarcity?
- Can I explain the process of fracking and create a detailed argument of the pros and cons?
- Can I describe the role of the USA in global politics?
- Can I state examples of the opportunities and challenges in Alaska?
- Can I state the impacts of deindustrialisation in Detroit?

Key definitions:

- Weather hazard – any naturally occurring weather condition that has the potential to cause harm or damage.
- Earthquake – the sudden shaking of the ground caused by plate tectonic movements that create powerful seismic waves.
- Population distribution – how the population of a country is spread out.
- Water scarcity - the lack of freshwater resources to meet the standard water demand.
- Fracking – the process of injecting liquid at high pressure into the ground to extract oil or gas.
- Deindustrialisation – the decline in industry due to offshoring, leaving an urban area with less manufacturing.

Key information:

1. The USA is in the northern hemisphere and is part of North America. The capital city is Washington D.C. However, USA is split into different states. Weather hazards happen in the USA due to its geographical positioning. Weather hazards are natural and can be monitored but not controlled. An example of one that hit the USA was Hurricane Katrina in August 2005.
2. Earthquakes are caused by tectonic plate movements and there are 3 types of plate boundaries, constructive (plates pulling apart), destructive (one plate subducting under another) and conservative (plates sliding past each other). The friction and pressure created causes seismic waves to be released which creates the earthquake. The Northridge earthquake is an example that has hit the USA.
3. Earthquake proofing is a method of preparation for hazards to reduce the impact. There are earthquake proof buildings across the world including in the USA. Examples of strategies include automatic window shutters, shoch absorbers and shear walls.
4. Areas can either be sparsely or densely populated. Reasons for the population distribution that is seen in the USA is its physical geography such as climate, landscape and water supplies as well as human geography which includes lifestyle, development and trade.
5. Death Valley is one of the most famous deserts in the world, known for its extreme conditions and its species incredible adaptation strategies for survival. Flooding in Death Valley is incredible rare – a once in 1000-year event. Water scarcity has main causes which are drought/climate change, poor water management coinciding with increasing demand and water pollution. Impacts of this includes food insecurity, water conflict and water trade.
6. Fracking is popular in the USA, with 30 states having reported fracking taken place. Fracking involves drilling deep wells and injecting fracking fluid into the ground to then extract the natural resource. There are advantages and disadvantages of fracking which include it being an alternative to coal, it being a way of meeting energy demands and the air and water pollution affecting the wildlife.
7. The USA is a superpower (a nation with significant influence politically, economically, culturally and in the military). The USA has a significant role in global politics because NATO was formed there in 1949 and the UN was also formed there after WW2, with the headquarters still being in New York City.
8. Alaska is a very important state to the USA due to its opportunities in fishing, mineral extraction and tourism. However, there are also challenges including landslides, building on permafrost and uneven ground.
9. Detroit was once a city that was thriving as a symbol of industrial power, however since manufacturing moved elsewhere, high crime rates is now common in Detroit, and there are now being efforts made to improve infrastructure and invest in tourist opportunities since it was named a UNESCO World Heritage Site.

Example exam questions:

1. Define the term "earthquake."
2. Describe the impacts of the Northridge earthquake.
3. Using the map, describe the population distribution of the USA.
4. Using the map. Describe the distribution of fracking in the USA.
5. Explain the advantages and disadvantages of fracking.
6. State two impacts of water scarcity.

Case study summary: Northridge Earthquake

Northridge earthquake happened in Reseda close by to Los Angeles on January 17th, 1994 – it was magnitude 6.7.
The major shock lasted 10-20 seconds.
Up to 60 people were killed and around 8700 were injured.
Theatres were closed due to structural damage and parking structures collapsed.
Apartment complexes collapsed and Interstate 10 was vastly damaged and collapsed.
There was an outbreak of valley fever, and 11 hospitals suffered structural damage and were damaged or rendered unusable.
While many businesses remained closed in the days following the quake, some infrastructure was not able to be rebuilt for months, even years later.
In response to the quake, the California Earthquake Authority was created to offer some coverage for earthquake damage.

History

Topics covered from the beginning of the academy year to the end of this half-term.

SPR 1:

1. Industrial Revolution

ARENA ACADEMY

To inspire our students' curiosity to discover their own story, to equip our students with the skills to open doors to the wider world and challenge our students to think critically, developing their perspective and judgement.

Inspiring • Skilful • Challenging

HISTORY Learning Journey

Power | Religion | War | Key individuals | Communication | People

Career Paths
- Academic researcher/archivist
- Heritage manager
- Historic building conservator
- Museum education officer
- Secondary school teacher

Further study
- History
- English
- Politics
- Economics
- Sociology

YEAR 11

Weimar & Nazi Germany
1918-1939
Nazi control & dictatorship 1933-39
The Weimar Republic 1918-29
Life in Nazi Germany 1933-39
Hitler's rise to power 1919-33

1941-1991
The end of the Cold War 1970-91
Cold War crises 1958-70
The origins of the Cold War 1941-58

Superpower Relations & the Cold War

Queen, government & religion 1558-69
Elizabethan society in the Age of Exploration 1558-88
1558-1588
Challenges to Elizabeth at home and abroad 1569-88
Early Elizabethan England

YEAR 10

'Medicine in modern Britain' c. 1900-Present Day
Medicine in Britain
'Medicine in 18th & 19th century Britain' c.1750-1900
1250 to present day
'The Medical Renaissance in England' c.1500-1700
'Medicine in medieval England' c.1250-1500

To what extent could ancient doctors heal the sick?
2nd - 5th c. BC
Has society learned lessons from the Holocaust?
20th c.

YEAR 9

What were the consequences of the Great War for Europe and the World?
20th c.
Why did the 'lights go out across Europe' in 1914?
20th c.
To what extent do the causes of WWII resemble those of WWI?
20th c.
What were the consequences of WWII for Europe and the World?

To what extent have women achieved equality since 1918?
20th c.
What does the Titanic tell us about society in the early 20th century?
18th – 19th c.
What role did the industrial Revolution have on the health of the people?

YEAR 8

Why did 'brother fight against brother' in the 17th century?
17th c.
To what extent was Britain changed by the Industrial Revolution??
18th – 19th c.
16th – 20th c.
To what extent did Britain's imperialism shape the world?
16th – 19th c.
What was the impact of the trans-Atlantic slave trade on those enslaved?
16th c.
To what extent was everyday life different in Tudor England compared to medieval?

Why was the Norman invasion of 1066 a success?
16th c.
Why was there religious turmoil in Tudor England?
11th – 15th c.
11th c.
To what extent did life change in the medieval period?
5th c.
6th c. BC
Why did the Roman Empire collapse?

YEAR 7

Welcome!

ARENA ACADEMY

Knowledge Organiser – Year 8: The Industrial Revolution

Industrial Revolution Timeline

1.	**1712 – Thomas Newcomen** invented a steam engine to pump out water from coal mines.
2.	**1760** - The First **Industrial Revolution** begins in the textile industry in Great Britain.
3.	**1779** - The **Spinning Mule** is invented by **Samuel Crompton**.
4.	**1796** - **Edward Jenner** performed the first **vaccination** against smallpox, this vaccine was widely used by 1840.
5.	**1801** - The **population** of Britain is about 9 million.
6.	**1825** - The first passenger **railway** opens.
7.	**1833** - The **Factory Act** bans children under 9 from working in textile mills. Children aged 13 to 18 are not to work more than 69 hours a week
8.	**1848** - **Cholera** strikes British towns.
9.	**1865** - **Antiseptic surgery** is introduced.
10.	**1875** - A law bans boys from climbing up chimneys to clean them.
11.	**1901** - The **population** of Britain is about 41 million.

Key Concepts

12. Industrial Revolution	The Industrial Revolution was a **huge change** in Britain between 1750-1900 where the country changed from living and working on the land, to living in cities and working in new factories.
13. Vaccination	A substance that is usually injected into a person or animal to protect against a particular disease. **Edward Jenner** invented and administered the first vaccine against smallpox in 1796.
14. Economy	The system of how money is made and used within a particular country. A country's **economy** is based on how many goods and services are produced and how much money is spent
15. Public Health	The approach to medicine that is concerned with the health of the public as a whole. During the Industrial Revolution, **Public Health Acts** were passed to ensure all people were safe at work and in their home.

Key Words

17. Textiles	Cloth made by weaving or knitting fibres together. The textile industry grew rapidly due to the invention of machines.
18. Cholera	A disease that causes diarrhoea and was spread by the faeces in the streets. John Snow discovered the link between water, sewage and cholera in 1849.
19. Agriculture	Agriculture is the process of producing food, and fibres by farming of certain plants and the raising of animals. Agriculture is also known as farming.
20. Canals	Canals, as well as coastlines and rivers, allowed transportation around Britain affordable and quick.
21. Sanitation	Sanitation is any system that disposes of human waste and separates sewers and drinking water. Sanitation was poor during the Industrial Revolution.
22. Mass Production	The production of many products, e.g. textiles. This method was introduced into the spinning of cotton thread by Richard Arkwright.
23. The Luddites	A worker who destroyed machinery, especially in cotton and woollen mills, that they believed was threatening their jobs.

Factories
mechanised production and allowed goods to be produced faster and more cheaply

Urbansation
the development of factories meant towns grew as more people moved there from the countryside

Religious Education

Topics covered from the beginning of the academy year to the end of this half-term.

AUT 1:

1. Hinduism

AUT 2:

2. Sikhism

Later on in the year:

3. Humanism
4. Evil and Suffering

RELIGIOUS STUDIES
Learning Journey

ARENA ACADEMY

A Level
Health & Social Care, Geography, Law, History, Sociology, Philosophy, Psychology or Politics

Apprenticeship
Arts, Media & Publishing, Travel & Tourism, Public services or Education & Training

UNIVERSITY · APPRENTICESHIP · COLLEGE · WORKPLACE

RS GCSE Examinations

GCSE Results Day

Revision

The Death Penalty

Religion, Crime and Punishment

Principle of Utility

Punishment and Aims

Protests

Reconciliation

Forgiveness

Religion, Peace and Conflict

Science Vs Religion

Stewardship Vs Dominion

Religion and Life

AQA

YEAR 11

Religion and Relationships

Contemporary family issues

Sacraments

Festivals

The Purpose of Families

Gender Roles

Christian Practices

Worship

Incarnation of God

Nature of God

Creation

Christian Beliefs

Festivals

Islam Practices

Worship

Risalah

Denominations

Nature of Allah

Islam Beliefs

YEAR 10

War and Peace

Privilege

Violence

Pacifism

Justice

Medical Ethics

Sanctity of Life

Quality of Life

Morality

Community

Equality

Human Rights & Social Justice

YEAR 9

Existence of Evil

Afterlife

Morality

Nature Vs Nurture

Evil and Suffering

Purpose

Humanism

Commitment

Codes of Conduct

Alternative Religions

Alternative vs mainstream

Guru Granth Sahib

Commitment

Guru Nanak

Sikhism

Incarnation of God

The Bible

The Original Sin

Christianity

Prophethood

Worship

Islam

The Qur'an

YEAR 8

Brahman

Hinduism

Karma & Reincarnation

Worship

Founding Fathers

Festival of Passover

Covenant

Judaism

Codes of Conduct

Rites of Passage

Community & Commitment

The Island

Welcome!

YEAR 7

Year 6 SATs

Visit to Arena Academy

CORE EDUCATION TRUST

ARENA ACADEMY

SIKHISM KNOWLEDGE ORGANISER

Overview

Sikhism is one of the world's major religions. It is the **world's 5th largest religion**, with about 28 million followers. It began over 500 years ago.

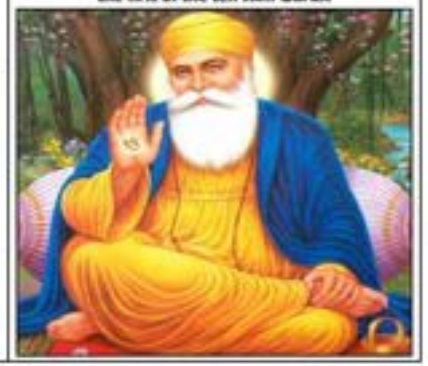
Sikhs are the people who follow Sikhism. Sikhs believe in one God who guides and protects them. Sikhs see everybody as being equal in God's eyes.

Sikhism was founded by a man called **Guru Nanak.** It is based on what he taught people. They believe that he received messages from God telling them how to live.

Leading a good life and **making the right choices** are important in Sikhism.

Granth Sahib is the holy book of **Sikhism.** Sikhs worship at home and in Sikh temples called **Gurdwaras.**

Image of Guru Nanak, the founder of Sikhism and the first of the ten Sikh Gurus.



Sikh Beliefs

Guru Nanak

-Sikhs believe that Guru Nanak was born in a small village called Punjab in India. He was born into a Hindu family, but grew up around Hindus and Muslims.

-Sikhs believe that Guru Nanak was spoken to by God, who told him to follow a simple faith, in which everybody was equal. In other religions, some people were thought of as better than others.

-His message was simple: pray to God, be honest, work hard, care for your family and your community. These ideas formed the basis of Sikhism.

Vaisakhi

-Vaisakhi marks the Sikh New Year. At this time, Sikhs remember when Khalsa was created.

-Khalsa was the purified Sikh community created by Guru Gobind Singh, in which all were equal.

-This event takes place in April, and also marks the start of the Harvest.

The Five Ks

- Sikhs often display their commitment to their religion by adhering to the 5 Ks, which are the 'Sikh Articles of Faith.'

1. Kesh – Uncut Hair
2. Kangha – Comb
3. Kara – Steel Bracelet
4. Kirpan – Sword
5. Kaccha – Soldier's shorts

The Five Ks are symbols for different Sikh ideals – each item links to a different belief.

Answers to Important Questions and Key Vocabulary

Where and how do Sikhs worship? Why?	 	-Sikh temples are called gurdwaras. They are built with a large central dome. -Gurdwaras have four doors, to show that they are open to all people, as a part of the Sikh belief that everyone is equal. Before Sikhs worship in a gurdwara, they should take a bath as a mark of respect and cleanliness. Shoes are taken off, and heads are covered.
What is the Sikh holy book?		-The Sikh holy text is the Guru Granth Sahib. It is exactly 1430 pages long in its printed form, and all of the hymns in it are in the same order. This helps Sikhs from everywhere to read it the same way.
Where do most Sikhs live in the world?	 	-Sikh people are mainly found in the Punjab region of north India, in Asia. In total, there are nearly 23 million Sikhs in India. -However, there are also populations of Sikhs on every inhabited continent. -The largest populations of Sikhs in countries outside of India are in the United States, Canada, the United Kingdom, and Malaysia. There are very few Sikhs in parts of Africa and Central America.
What are some other Sikh traditions?		-When a Sikh baby is born, the whole community turn out to celebrate! Fathers traditionally tell the news to friends and family, and the baby name is revealed in a ceremony at the gurdwara. -Sikh names are easily distinguishable. Boys and men are given an extra Sikh name – Singh – meaning 'lion.' Girls and women have Kaur – 'princess.'

Key Vocabulary

- Sikh
- Guru Nanak
- India
- Punjab
- Granth Sahib
- El Onkar
- Gurdwara
- Gobind Singh
- Nishan Sahib
- Golden Temple
- Vaisakhi
- The Five Ks

Top 10 Facts!

1. Sikhs take their name from 'sikha', meaning disciples.
2. El Onkar ('God is one') is the most powerful teaching in the Sikh religion.
3. Sikhs often sit on the floor together whilst eating, to show that everyone is equal.
4. Most of the hymns sung in gurdwaras today were written by the Sikh Gurus.
5. To keep their long hair tidy, many men wrap their hair in a turban - a piece of material.
6. Not all Sikh men and women join the Khalsa. It is a choice and involves an initiation ceremony.
7. The most holy place for Sikhs is the Golden Temple of Amritsar, in Punjab, India.
8. The last Guru, Gobind Singh, decided that there should be no more Gurus.
9. The symbol of Sikhism is known as the Khanda.
10. Sikhs have their own flag. It is known as the Nishan Sahib and is found outside gurdwaras.

Sikhism Timeline

- 1469 CE: Birth of Guru Nanak.
- 1481 CE: Guru Nanak refuses to wear the 'golden thread.'
- 1500 CE: Nanak travels, spreading the message of equality.
- 1539 CE: Guru Nanak dies.
- 1606 CE: Guru Arjan, the 5th Guru, is tortured to death for being a Sikh.
- 1699 CE: The tenth Guru, Gobind Singh, founds the community of the Khalsa.
- 1708 CE: Gobind Singh dies. He is the last of the human Sikh Gurus.
- 1716 CE: The first of the Sikh military leaders – Banda Singh Bahadur. He leads many military campaigns.

Problem of Evil

1) Different approaches to POE

Most people experience suffering at some time in their life. Religions attempt to explain suffering, help people to cope with it and learn from it. For some religious people, the fact that people suffer can raise difficult questions about why God allows this to happen.
Evil and suffering can also make people question their religious beliefs and sometimes reject the existence of God completely.

3)How does Islam explain Suffering?

For Muslims everything that happens is the will/plan of God. This includes suffering and evil. They are part of Allah's great plan.
Allah is testing people with suffering, to see if they will still believe in Him or if they will follow evil (devil)
Sometimes you have to suffer in order for some good to take place.
Muslims are expected to be patient and trust in Allah

Keywords

Omniscient	All-knowing
Omnipotent	All-powerful
Benevolent	All-Loving
Theodicy	an attempt to explain how God can be omnipotent, omniscient, love us and yet still allow us to suffer
Natural Evil	This kind of suffering is that which is caused by the world we live in
Moral Evil	This kind of suffering is that which is brought out about by the cruel actions of people
Genocide	The deliberate and systematic destruction of a religious, racial, national, or cultural group.
Anti Semitism	Hostility to or prejudice against Jews.
Persecution	hostility and ill-treatment, especially because of race or political or religious beliefs; oppression

2) Christian Response to Problem of evil.

Christians believe Evil is the fault of humans misusing their free will. It is not God's fault and that We cannot possibly understand the mind of God and so cannot explain why he chooses to let evil exist

4) Jewish responses to the POE

Most Jews believe that everything God does is for good. From a human perspective, some actions might seem evil, but they trust that whatever happens on Earth is ultimately according to God's plan, which is good. Jews believe suffering can bring people closer to God. In times of trouble many people turn to religion for comfort and support.
Some Jews believe suffering helps people to **empathise** with others and to assist them when necessary.

Questions raised by the existence of evil and suffering in the world

- What does the presence of evil and suffering say about God's love, power and purpose?
- Is there a purpose to suffering?
- Is suffering the price humans pay for ?
- How do different religions respond to evil and suffering?
- How do individuals respond to evil and suffering?

Computer Science

Topics covered from the beginning of the academy year to the end of this half-term.

SPR 1:

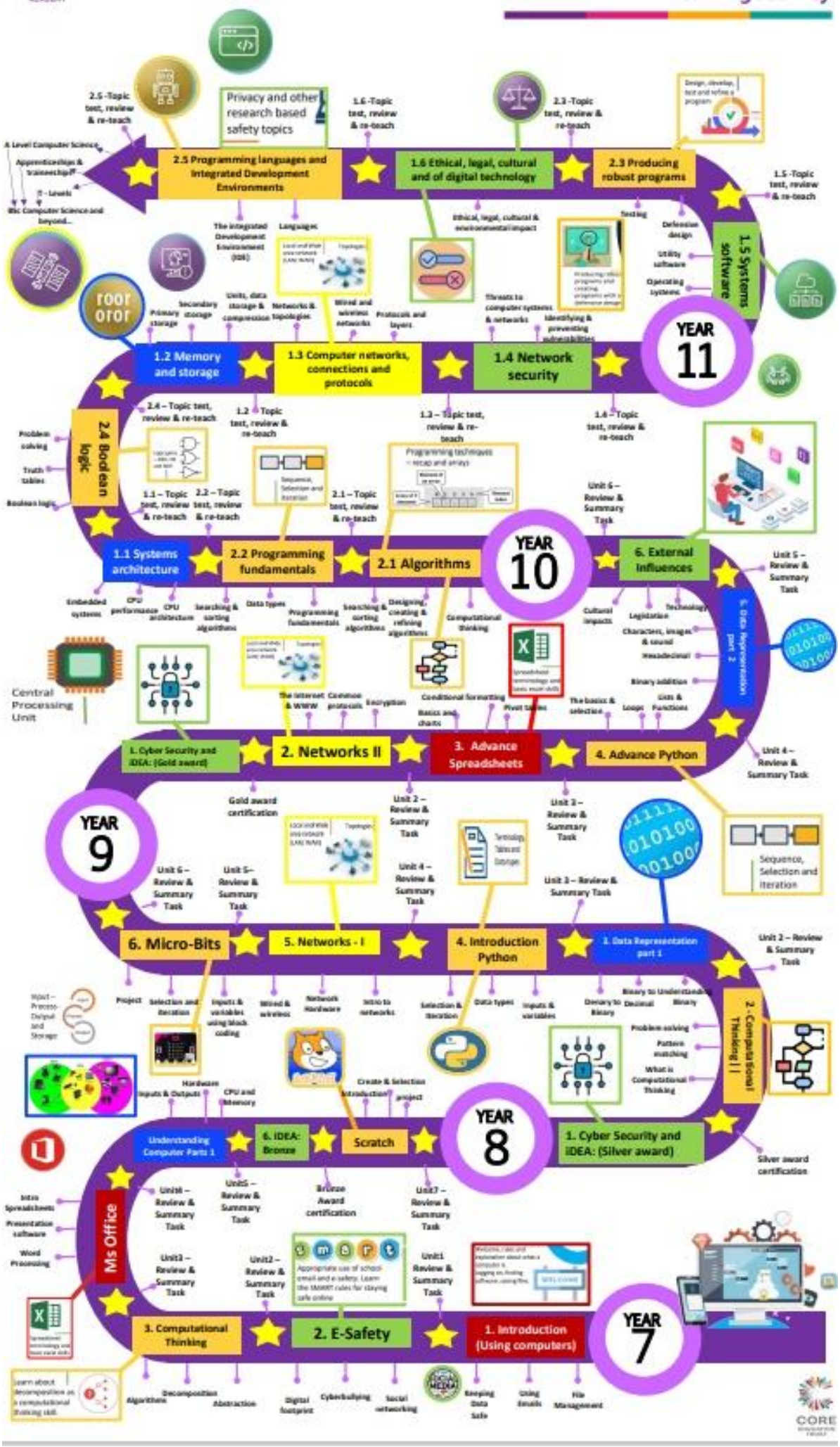
1. Data Representation 1

SPR 2:

2. Intro to Python

Computer Science/IT

Learning Journey



Converting denary (base 10) to binary (base 2)

Converting 30 to binary

Step 1: Write down the binary placeholders.

32	16	8	4	2	1

Step 2: Find the largest placeholder that is less than or equal to the denary number. Write a 1 underneath this placeholder.

32	16	8	4	2	1
	1				

Step 3: Subtract placeholder from the original number

30-16 = 14

Step 4: Repeat this process with the result until you're left with 0

32	16	8	4	2	1
	1	1			

14-8 = 6

32	16	8	4	2	1
	1	1	1		

6-4 = 2

Converting binary (base 2) to denary (base 10)

Converting 100101 to denary

Step 1: Write the placeholders over your binary number (start on the right):

32	16	8	4	2	1
1	0	0	1	0	1

Step 2: List all the placeholders with 1 underneath:

- 32
- 4
- 1

Step 3: Add up your list

32+4+1 = 37

Converting denary (base 10) to binary (base 2) - continued

32	16	8	4	2	1
	1	1	1	1	

2-2 = 0

Step 5: Fill in the remaining placeholders with 0s

32	16	8	4	2	1
0	1	1	1	1	0

Therefore 30 in base 2 is **011110**

Introduction to Python using Edu blocks

Coding: We use coding when making programs. For example, you are used to using blocks in Microbits or Scratch, these are forms of coding as well.

Sequence: The instructions for the code

Selection: Logical tests to change the flow of sequence

Iteration: Looping code to be repeated in a program

Turtle: Within python there is a module known as Turtle. We use turtle within python to draw shapes using a set of instructions and iterating it (repeating the code). This way turtle then can independently draw the shapes.

Input: During program this is used to make a program user friendly.

E.g., it could be something simple as entering a name.

Data Types: These are used within programming to specify what data can be entered. In Edu blocks we will be using three types:

- **String: A sequence of numbers and letters/special characters**
- **Integer: For whole numbers**
- **Float: A number with a decimal place**

If Statements: In programming, you need to make decisions based on conditions. For example, you can make a program which decides on the weather.

Variables: These are known as data containers. For example, if I make a variable in a program called NAME. When a user enters their name, it will be stored using the variable. Variables can be changed.

Constants: These are unchangeable unlike variables.

Function: A function is a command which contains the steps needed to perform a task.

Assignment: It sets or resets a value stored within a variable and can be changed.

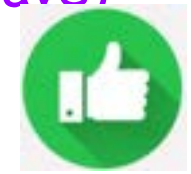
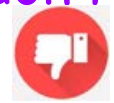
ARENA ACADEMY

Spanish

Unit 2a - ¿Cómo eres? (How are you like?)

Tengo (I have) 	el pelo (hair)	negro (black) rubio (blonde) ⚠ castaño (brown) ⚠ rizado (curly) liso (straight) 
	los ojos (eyes)	azules (blue)
No tengo (I don't have) 	el pelo (hair)	largo (long) corto (short) blanco (white) gris (grey) pelirrojo (ginger)
	los ojos (eyes)	verdes (green) marrones (brown) 

Unit 2b - ¿Puedes describirte? (Can you describe yourself?)

Soy (I am) 	calvo (bald) gordo (fat) atlético (athletic) alta (tall) delgada (thin) bonita (pretty)
No soy (I am 	feo (ugly) hermoso (beautiful)
Tengo (I have) 	pecas freckles) gafas (glasses)
No tengo (I don't have) 	bigote (moustache) barba (beard)

These words can be used with 'No soy'

These words can be used with 'No tengo"

Unit 2c - ¿Cómo es tu mejor amigo? (How is your best friend?)

Mi mejor amigo (Mi best friend) 	es (is) 	gordo (fat) atlético (athletic) alto (tall) delgado (thin) hermoso (beautiful)	 These words can be used with 'no es'
	no es (is not) 	feo (ugly) calvo (bald)	
Mi mejor amiga (My best friend) 	es (is) 	atlética (athletic) alto (tall) delgada (thin) bonita (pretty) hermosa (beautiful)	 These words can be used with 'es'
	no es (is not) 	fea (ugly) calva (bald)	

Unit 2d - ¿Puedes describir a tu mejor amigo? (Can you describe your best friend?)

Mi mejor amigo (My best friend)

Mi mejor amiga (My best friend)

tiene (has)

no tiene (doesn't have)

el pelo (hair)

negro (black)
rubio (blonde)
castaño (brown)
rizado (curly)
liso (straight)
pelirrojo (ginger)

pecas (freckles)
gafas (glasses)
bigote (moustache)
barba (beard)

los ojos (eyes)

verdes (green)
marrones (brown)
azules (blue)

pero (but)

y (and)

tiene (has)

no tiene (doesn't have)

el pelo (hair)

negro (black)
rubio (blonde)
castaño (brown)
rizado (curly)
liso (straight)
pelirrojo (ginger)

pecas (freckles)
gafas (glasses)
bigote (moustache)
barba (beard)

los ojos (eyes)

verdes (green)
marrones (brown)
azules (blue)

Unit 2e - ¿Tienes una mascota? (Do you have a pet?)

Tengo (I have) 	un perro (a dog) un gato (a cat) un conejo (a rabbit) un caballo (a horse) un pez (a fish) un pájaro (a bird) un ratón (a mouse)		blanco (white) pelirrojo (ginger) verde (green) marrón (brown) naranja (orange) amarillo (yellow) gris (grey) azul (blue)
No tengo (I don't have) 	una serpiente (a snake) una tortuga (a tortoise) una rata (a rat) una araña (a spider) una iguana (a iguana)		blanca (white) roja (red) negra (black) gris (grey) verde (green)

Unit 3a -¿Quién hay en tu familia?

(Who is in your family?)

https://quizlet.com/gb/604264437/year-7-unit-3a-quien-hay-en-tu-familia-flash-cards/

En mi familia
(In my family)

hay
(There is/are)

tres/cinco/siete personas (three/five/seven people)

mi madre (my mother)
mi padre (my father)
mi madrastra (my stepmother)
mi padrastro (my stepfather)
mi hermanastra (stepsister)
mi hermanastro (my stepbrother)
mi sobrina (my niece)
mi sobrino (my nephew)
mi tia (my aunt)
mi tio (my uncle)
mi primo/a (my cousin)
mi abuela (my grandmother)
mi abuelo (my grandfather)

que se llama
(who is called…)

mis padres (my parents)
mis abuelos (my grandparents)
mis hermanos (my brothers)
mis hermanas (my sisters)
mis hermanos gemelos (my twin brothers)

que se llaman…y…
(who are called…and…)

y yo (and me)

Soy
(I am)

hija única (an only daughter)
hijo único (an only son)

Unit 3b - ¿Que hay en la foto?

(What is there in the photo?)

https://quizlet.com/gb/604264761/year-7-unit-3b-que-hay-en-la-foto-flash-cards/

En la foto

(In the photo)

hay

(there is)

no hay

(there is not)

puedo ver

(I can see)

no puedo ver

(I cannot see)

un hermano y una hermana (a brother and a sister)
un abuelo y una tía (a grandad and a aunt)

un teatro (a theater)
un restaurante (a restaurant)
un laboratorio de ciencias (a science laboratory)

moderno (modern)
bonito (pretty)
nuevo (new)
muy grade (very big)

un aula (a classroom this is a feminine word but uses 'un')
dos/tres/cuatro aulas (two/three/four classrooms)
una sala de ordenadores (a computer room)
una piscina (a swimming pool)

moderna (modern)
bonita (pretty)
nueva (new)
muy grade (very big)

unas tijeras azules (some blue scissors)
tres cuadernos (three notebooks)
una regla negra (a black ruler)
unos lápices de colores (some colored pencils)

Unit 3c - ¿De dónde eres?

(What nationality are you?)

https://quizlet.com/gb/604265056/year-7-unit-3c-de-donde-eres-flash-cards/

Soy (I am) Mi madre es (My mum is) Mi padre es (My dad is)	irlandés (Irish) griego (Greek) alemán (German) inglés (English) latinoamericano (Latin-American) británico (British) europeo (European) escocés (Scottish) español (Spanish) francés (French) gáles (Welsh) norteamericano (North American)		irlandésa (Irish) griega (Greek) alemána (German) inglésa (English) latinoamericana (Latin-American) británica (British) europea (European) escocésa (Scottish) español a (Spanish) francésa (French) gálesa (Welsh) norteamericana (North American)		Vengo de (I come from) El/Ella viene de (He/she comes)	Irlanda (Ireland) Grecia (Greece) Alemania (Germany) Inglaterra (England) Europa (Europe) Gran Bretaña (Great Britain) Los Estados Unidos (The United States) Escocia (Scotland) España (Spain) Francia (France) Gales (Wales) Chile (Chile)

Unit 3d - ¿Puedes describir un miembro de tu familia?

(Can you describe a member of your family?)

https://quizlet.com/gb/604265251/year-7-unit-3d-puedes-describir-un-miembro-de-tu-familia-flash-cards/

Mi madre (my mother) Mi padre (my father) Mi madrastra (my stepmother) Mi padrastro (my stepfather) Mi hermanastra (stepsister) Mi hermanastro (my stepbrother) Mi sobrina (my niece) Mi sobrino (my nephew) Mi tia (my aunt) Mi tio (my uncle) Mi primo/a (my cousin) Mi abuela (my grandmother) Mi abuelo (my grandfather)	se llama … y (is called … and)	es baja (is short) es alto (is tall) tiene el pelo gris (has grey hair) tiene los ojos azules (has blue eyes) es bonita (is pretty) es atlético (is athletic) tiene una barba (has a beard) tiene el pelo rizado (has curly hair) es feo y calvo (is ugly and bald) no es alta y tiene gafas (is not tall and she has glasses) no es bajo y tiene un bigote (is not short and he has a moustache)

Unit 3e - ¿Cómo es tu familia?

(What is your family like?)

https://quizlet.com/gb/604265560/year-7-unit-3e-como-es-tu-familia-flash-cards/

Pienso que (I think that) Encuentro que (I find that)	mi madre (my mother) mi padre (my father) mi madrastra (my stepmother) mi padrastro (my stepfather) mi hermanastra (stepsister) mi hermanastro (my stepbrother) mi sobrina (my niece) mi sobrino (my nephew) mi tia (my aunt) mi tio (my uncle) mi primo/a (my cousin) mi abuela (my grandmother) mi abuelo (my grandfather)	es amable (is nice) es amistoso/a (is friendly) es educado/a (is educated) es antipático/a (unfriendly) es cariñoso/a (is caring) es comprensivo/a (is understanding) es egoísta (is selfish) es travieso/a (is naughty) es honrado/a (is honest) es maleducado/a (rude) es hablador/a (is talkative) es gracioso/a (is funny)

Unit 3f - ¿Te llevas bien con tu familia?

(Do you get along well with your family?)

https://quizlet.com/gb/651891223/year-7-unit-3f-te-llevas-bien-con-tu-familia-flash-cards/

Me llevo bien (I get along well) Me llevo muy bien (I get along very well) Me llevo mal (I get along badly) Me llevo muy mal (I get along very badly)	con (with)	mi madre (my mother) mi padre (my father) mi madrastra (my stepmother) mi padrastro (my stepfather) mi hermanastra (stepsister) mi hermanastro (my stepbrother) mi sobrina (my niece) mi sobrino (my nephew) mi tia (my aunt) mi tio (my uncle) mi primo/a (my cousin) mi abuela (my grandmother) mi abuelo (my grandfather)	porque (because he/she)	es amable (is nice) es amistoso/a (is friendly) es educado/a (is educated) es antipático/a (unfriendly) es cariñoso/a (is caring) es comprensivo/a (is understanding) es egoísta (is selfish) es travieso/a (is naughty) es honrado/a (is honest) es maleducado/a (rude) es hablador/a (is talkative) es gracioso/a (is funny)

ARENA
ACADEMY

French

Où vas-tu pendant les vacances? Avec qui vas-tu?

Avec quelle fréquence? (Adverbs of Time)	Quelle saison? (Noun)	Subject + Verb (Qui/quoi?)	Où? (Where?)	Avec qui? (With whom?)

Quizlet Year 8, Unit 11a - Où vas-tu pendant les vacances?

(Where do you go during your holiday)

https://quizlet.com/gb/602517994/year-8-unit-11a-ou-vas-tu-pendant-les-vacances-flash-cards/

Normalement (Normally)	en été (in summer) en hiver (in winter) en automne (in autumn) au printemps (in spring)	je vais en vacances (I go on holiday) je passe les vacances (I spend the holidays)	en Angleterre (in England) en Espagne (in Spain) en Allemagne (in Germany) en Écosse (in Scotland) au Pays de Galles (in Wales) aux États-Unis (in the USA) chez moi (at home)	avec ma belle-mère (with my step-mother) avec mon beau-père (with my step-father) avec ma soeur (with my sister) avec mon frère (with my brother) avec mes amis/copains (with my friends) avec mes proches (with my relatives) avec mes parents (with my parents)

Quizlet Year 8, Unit 11b - Où vas-tu pendant les vacances?

(Where do you go during your holiday?)

https://quizlet.com/gb/602520629/year-8-unit-11b-ou-vas-tu-pendant-les-vacances-flash-cards/

En été (in summer) En hiver (in winter) En automne (in autumn) Au printemps (in spring)	je vais en vacances (I go on holiday) je passe les vacances (I spend holidays)	à la mer (at the seaside) à la montagne (in the mountains) à la campagne (at the countryside) à l'étranger (abroad) chez moi (at home) chez mes copains (at my friends' place) chez mes grandparents (at my grandparents' place) chez mon oncle/ma tante(at my uncle's/my aunt's place)

Quizlet Year 8, Unit 11c - Qu'est-ce que tu fais? (What do you do?)

https://quizlet.com/gb/602721314/year-8-unit-11c-quest-ce-que-tu-fais-flash-cards/

S'il fait mauvais
(If it's bad weather)

S'il fait beau
(If it's nice weather)

S'il fait chaud
(If it's hot)

S'il fait froid
(If it's cold)

S'il y a du soleil
(If it's sunny)

S'il neige
(If it snows)

S'il pleut
(If it rains)

je reste chez moi
(I stay at home)
je mange de la glace
(I eat ice-cream)
je bois du chocolat chaud au café
(I drink hot chocolate at the café)
je vais à la plage
(I go to the beach)
je nage dans la mer
(I swim in the sea)
je nage dans la piscine
(I swim in the swimming pool)
je regarde un film
(I watch a movie)
je fais du tourisme
(I do sightseeing)
je fais un bonhomme de neige
(I make a snowman)
je fais du shopping
(I do some shopping)
je fais du skate
(I do skateboarding)
je fais du ski
(I do skiing)

Quizlet Year 8, Unit 11d - Comment voyages-tu? Pourquoi?

(How do you travel? Why?)

https://quizlet.com/gb/602724114/year-8-unit-11d-comment-voyages-tu-pourquoi-flash-cards/

Je préfère voyager

(I prefer to travel)

Je n'aime pas voyager

(I don't like to travel)

en auto
(by car)
en autobus
(by bus)
en avion
(by plane)
en bateau
(by boat)
en car
(by coach)
en moto
(by motorbike)
en voiture
(by car)
en ferry
(by ferry)
en train
(by train)
en hélicoptère
(by helicopter)
en tram
(by tram)
à pied
(on foot)

car
(because)

c'est plus
(it's more)

c'est moins
(it's less)

confortable
(comfortable)
cher
(expensive)
vite
(quick)
rapide
(fast)
pratique
(practical)
facile
(easy)
passionnant
(exciting)
relaxant
(relaxing)
luxueux
(luxurious)
sûr
(safe)
moderne
(modern)
écologique
(ecological)

Quizlet Year 8, Unit 11e - Où vas-tu aller en vacances l'année prochaine?

(Where are you going to go on holiday next year?)

https://quizlet.com/gb/602726595/year-8-unit-11e-ou-vas-tu-aller-en-vacances-lannee-prochaine-flash-cards/

À l'avenir (In the future) L'année prochaine (Next year)	je vais aller (I am going to go)	en Angleterre (to England) en France (to France) en Italie (to Italy) en Écosse (to Scotland) en Espagne (to Spain) en Irlande (to Ireland) en Allemagne (to Germany) en Suisse (to Switzerland) en Afrique (to Africa) en Australie (to Australia) au Portugal (to Portugal) aux États-Unis (to the USA)	car c'est (because it's)	intéressant (interesting) passionnant (exciting) joli (pretty) cher (expensive) bon marché (cheap) proche (close) chouette (great) tranquille (peaceful) propre (clean) animé (lively) incroyable (incredible) différent (different)

Quizlet Year 8, Unit 11e - Où vas-tu aller en vacances l'année prochaine?

(Where are you going to go on holiday next year?)

https://quizlet.com/gb/602726595/year-8-unit-11e-ou-vas-tu-aller-en-vacances-lannee-prochaine-flash-cards/

À l'avenir (In the future) L'année prochaine (Next year)	je vais aller (I am going to go)	en Angleterre (to England) en France (to France) en Italie (to Italy) en Écosse (to Scotland) en Espagne (to Spain) en Irlande (to Ireland) en Allemagne (to Germany) en Suisse (to Switzerland) en Afrique (to Africa) en Australie (to Australia) au Portugal (to Portugal) aux États-Unis (to the USA)	car c'est (because it's)	intéressant (interesting) passionnant (exciting) joli (pretty) cher (expensive) bon marché (cheap) proche (close) chouette (great) tranquille (peaceful) propre (clean) animé (lively) incroyable (incredible) différent (different)

Art

Topics covered from the beginning of the academy year to the end of this half-term.

AUT 1:

1. What is a portrait
2. Renaissance portraiture
3. What is abstract portraiture
4. Josh Byran
5. Facial proportion

AUT 2:

6. Facial features
7. Pencil portrait observation
8. What is Cubism
9. Fragmentation and collage

Performing Arts:Drama

Topics covered from the beginning of the academy year to the end of this half-term.

AUT 1:

Drama

1. Scornbury Manor
2. Projection/tone
3. Soundscapes
4. Improvisation

AUT 2:

Drama

4. Atmosphere/tension
5. Staying in character
6. Drama Techniques (advanced)

Performing Arts:Music

Topics covered from the beginning of the academy year to the end of this half-term.

AUT 1:

Music

1. World Music
2. Reggae
3. Blues
4. Latin/Samba
5. Indian
6. Music features

AUT 2:

Music

4. Themes and Variations
5. Listening and music analysis
6. Introduction to Logic

Physical Education

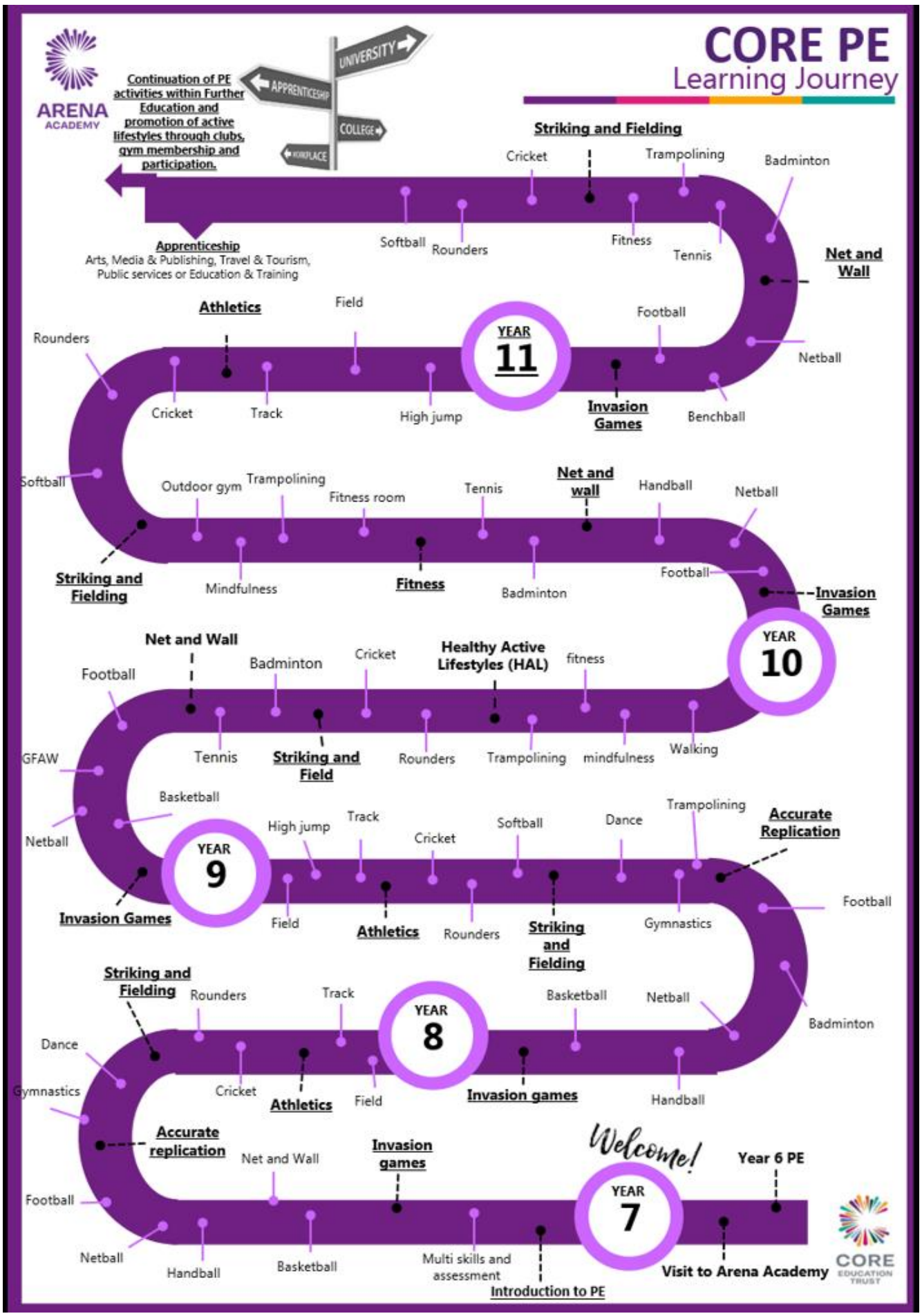
Topics covered from the beginning of the academy year to the end of this half-term.

<u>SPRING 1:</u>

1. FOOTBALL
2. BADMINTON
3. GYMNASTICS
4. DANCE

<u>SPRING 2:</u>

4. FOOTBALL
5. BADMINTON
6. GYMNASTICS
7. DANCE


CORE PE
Learning Journey
ARENA ACADEMY
Continuation of PE activities within Further Education and promotion of active lifestyles through clubs, gym membership and participation.
UNIVERSITY
APPRENTICESHIP
COLLEGE
WORKPLACE
Apprenticeship
Arts, Media & Publishing, Travel & Tourism, Public services or Education & Training
Striking and Fielding
Cricket
Trampolining
Badminton
Softball
Rounders
Fitness
Tennis
Net and Wall
Athletics
Field
Rounders
Football
YEAR 11
Netball
Cricket
Track
High jump
Invasion Games
Benchball
Softball
Outdoor gym
Trampolining
Fitness room
Tennis
Net and wall
Handball
Netball
Striking and Fielding
Mindfulness
Fitness
Badminton
Football
Invasion Games
Net and Wall
Football
Badminton
Cricket
Healthy Active Lifestyles (HAL)
fitness
YEAR 10
Tennis
Striking and Field
Rounders
Trampolining
mindfulness
Walking
GFAW
Basketball
Netball
High jump
Track
Cricket
Softball
Dance
Trampolining
Accurate Replication
YEAR 9
Invasion Games
Field
Athletics
Rounders
Striking and Fielding
Gymnastics
Football
Striking and Fielding
Rounders
Track
Basketball
Netball
YEAR 8
Badminton
Dance
Gymnastics
Cricket
Athletics
Field
Invasion games
Handball
Accurate replication
Net and Wall
Invasion games
Welcome!
Year 6 PE
Football
YEAR 7
Netball
Handball
Basketball
Multi skills and assessment
Visit to Arena Academy
Introduction to PE
CORE EDUCATION TRUST

Physical Education Department – Knowledge organiser – FOOTBALL

Volley – The volley involves striking a ball that is still in the air. Focus eyes upon the ball. Arms out for balance. Keep eyes focused on the ball as you get into the line of flight. Head still. Non kicking foot on the floor and lead with the kicking leg forward.

Turning with the ball

Cruyff - Great skill for losing your opponent.
Named after the brilliant Dutchman Johan Cruyff.
Shape as if to pass or cross but then drag the ball behind your standing leg with the inside of foot. Turn your shoulders and your hips so that you are back in line with the ball and then race away.

Step over – Skill for sending an opponent in the opposite direction.
Lift your foot over the top of ball to use a 'step over' and this should immediately create you time and space. Then hook the ball away with the outside of the foot and race away.

Inside Hook - You need to keep your body between the ball and your opponent.
Reach round the outside of the ball with your foot so that you can change its direction. Bend your knees so that you can transfer your weight quickly and turn your hips to change your own direction. Then get a positive first touch on the ball that puts it into an area that is comfortable for you to move on to and accelerate away from your opponent .

Outside Hook – This tricks your opponent
Use the outside of the foot to hook the ball back in the direction that you are going to go.

Drag Back - The drag back is a great turn to use when you haven't got a lot of space to work.
Place one foot on top of the ball and staying in contact with it throughout, roll it back and move off in the opposite direction.

Team formation

4-4-2 (4 defenders, 4 midfielders and 2 strikers) a traditional team set up
5-4-1 (5 defenders, 4 midfielders and 1 striker) A more defensive set up.
3-5-1-1 (3 defenders, 5 midfielders, and 2 strikers one in front of each other). A more attacking set up.

Counter attacking – The team withdraws players into their own half but ensuring that one or two players are committed to the attack

Direct long ball football – Often used to deride 'boring' teams, the long-ball style of play is genuine route one football. Rather than spending time on the ball picking up the pass, exploiting small gaps in the opposition's defence or utilising the flanks, the long-ball is employed as an opportunistic method of attack.

Wide/Wing plays – The ball is played to the wings. By spreading the ball wide, you allow a different angle of attack and offer a number of opportunities for the winger; take on the fullback and drag central defenders out of position, cut inside and drive forward at an angle, or whip in a cross from deep for the strikers to attack.

Off side - An attacking player is flagged offside by the assistant referee if there is only one defending player between the player and the goal line at the time the ball is struck. The player should be in active play if the offside offense is to be called.

Throw in - A method of restarting play during the game, when the ball has exited the side of the field of play. Throw in is taken from where it went out. At the moment of delivering the ball, the thrower must face the field of play. The thrower must have part of each foot on the touchline or on the ground outside the touchline, and use both hands to deliver the ball from behind and over the head.

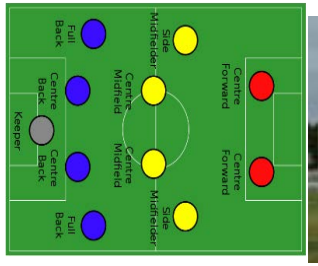
Cruyff Turn

Inside Hook

Step over

Free Kick

4-4-2 example



Throw in

PE: Badminton

Physical Education Department – Knowledge organiser – BADMINTON year 7, 8 and 9

Skills and Techniques

Forehand- A forehand shot is where the racket is away from the body, for example if you are right handed the racket will be towards the right side of your body.

Backhand- A backhand shot is where the racket is across the body and towards the opposite side to your strong hand. For example if you are right handed it will be across your body and hitting from the left side.

Serving- There are 4 types of serve: Low, High, Flick and Drive. The low is gently placed over the net to land at the front of the court. The high is opposite, a powerful serve which lands at the back of the court. The flick serve is similar to the high but lands more mid court. The drive serve is a flat, low and powerful serve which is aimed towards the back of the court.

Grip- The grip of the racket is very similar to a hand shake. To test you have the correct grip hold the racket head in your hand, then carefully slide your hand down the racket. Then, wrap your fingers around the handle. You will slightly change your grip when you play a backhand shot as your wrist will turn towards the net.

Footwork- Side stepping will be the majority of the footwork you do, it allows you to move around the court efficiently while still maintaining proper hitting form. Your legs should be square with your body and move side-to-side. Regardless of the direction you are moving, your head should always be facing the net.

Skills and Techniques

Drop shot – A drop shot is a front of court shot, similar to a net shot but from mid court. It travels a long distance but aims to drop to the floor as soon as it goes over the net. The shuttle needs to be hit with a high elbow at the highest point possible to ensure it reaches the opponents court side.

Smash shot – This is a powerful shot which most of the time will win you the point. It is a mid-court shot which moves in a downwards motion very powerfully so it is almost impossible for your opponent to return the shuttle. This is in a downwards motion and power is needed from your shoulder and arm.

Net shot – This is where the shuttle glides just over the net, almost in touching distance. This is a hard shot to return as it is very low to the floor when it goes over the net so the player must be quick to get low and return this. You must lean over the net ensuring you do not touch it and hit the shuttle gently in a downwards motion.

Clear shot – This is a long shot which aims to land in the back tram line of the court. This is helpful if your opposition tends to play close t the net as they will not have much time to get to the back of the court to return the shuttle. To ensure this is successful you must ensure your elbow is high and you make contact with the racket and shuttle at its highest point with a lot of power.

Singles court – short and wide

Doubles court – Long and narrow

Glossary

Shot Serve Net Rally Smash Drop Drive

Forehand Backhand Grip Footwork Underarm

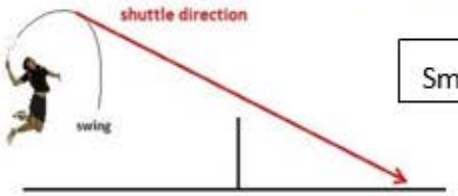
Shuttlecock Racket Overarm Tramline Flick

Singles doubles High Low Short Long

Pictures

Forehand

Backhand



Smash shot

Physical Education Department – Knowledge organiser - Dance

Key Skills/Techniques

Balance
Being able to keep a stable body (without wobbling or falling) over a base of support e.g hands and feet

Body Awareness
Understanding how your body is moving in relation to the music/apparatus/partner and understanding its capabilities whilst performing

Cannon
This is where a group of performers repeat the same action one after another. For example, the Mexican wave.

Choreography
Being able to create a dance routine/sequence of movements to music or without.

Control
The power to direct your body and body parts to master the intended movement

Coordination
Being able to move different body parts at the same time

Dynamics
Being able to change the way your body moves. For example fast/Slow/Jerky/Smooth

Reaction
To respond to the movement and actions of others

Travelling
To move from one place to another

Core Skills needed in Creative:

- Confidence
- Creativity
- Leadership
- Organisation
- Resilience
- Initiative
- Communication

Motif
A motif is a movement phrase that is repeated and developed throughout a sequence/routine

Unison
Completing the same movement at the same time.

Flight
Shapes and positions made whilst you are in the air

Matching
When two or more students perform the same movement at the same time in the same direction, matching each other

Mirroring
Perform the same movement but in different directions to create a mirror image.

Rolling
Forwards, backwards, pencil roll

Apparatus can be used such as:
Benches, mats, box. Vault, trumpet. In addition, you can use props to support the characterisation of your routine/sequence

Glossary

Body Tension **Travel** **Roll**

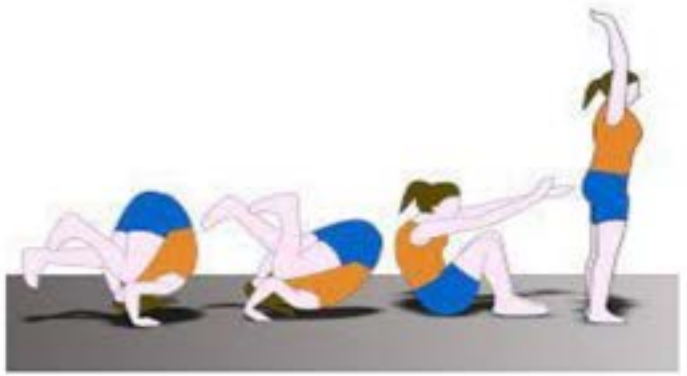
Hop **Unison** **Body Extension**

Flexibility **Skip** **Jump** **Cannon**

Performance **Balance** **Movement**

Stimulus **Speed** **Levels**

Pictures



Physical Education Department – Knowledge organiser - Gymnastics

Teacher Glossary

Word	Definition	How do I do this?
Balance	an even distribution of weight enabling someone or something to remain upright and steady.	Engage your core muscles. Focus on a spot and use your arms to steady yourself.
Jump	push oneself off a surface and into the air by using the muscles in one's legs and feet.	Bend your knees as you take off and land. Use your arms to get a higher jump. In gymnastics, finish nicely.
Turn	move in a circular direction wholly or partly round an axis or point.	Use your arms to get momentum in your body. Spot as you turn.
Roll	move in a particular direction by turning over and over on an axis.	There are different types of rolls. For a forward roll, you need to tuck your chin uner so it's touching your chest. You don't use your head to roll onto.

Key Skills – S.E.T

Social: Co-operation
Social: Communication
Social: Coming to decisions with a partner and team
Social: Respect
Emotional: Acceptance
Thinking: Interesting movement
Thinking: Observing and providing feedback
Thinking: Selecting and applying actions

Key Skills - Physical

Travelling
Balancing
Jumping
Rolling
Turning

Inspiring Athlete

Simone Biles

Links to the National Curriculum

- Develop flexibility, strength, technique, control and balance [for example, through athletics and gymnastics]
- Perform dances using a range of movement patterns
- Compare their performances with previous ones and demonstrate improvement to achieve their personal best.

Key Vocabulary for children

Forward roll
Backward roll
Straight roll
Barrel roll
Finish
Jump (quarter, half and full)
Turn (quarter, half and full)
Straddle roll
Balance

ARENA ACADEMY

Design Technology

ARENA
ACADEMY

Personal Development

1	**Why do you need to Know British Values?** Understanding British values is an important way to enable you to embrace the key values that you need to be equipped for life in modern British society. There are 5 fundamental British Values. **Through understanding the British values of Democracy, the Rule of Law, Individual Liberty, Mutual Respect, and Acceptance for those with different faiths and beliefs**, you will develop self-knowledge, be better able to make the right choices and make contributions to the school and the wider community.		
Democracy			
2	**Democracy**	8	Examples of Political Parties: Liberal Democrats, Labour, Green Party, Conservatives
3	In the United Kingdom we vote (age 18 +) for the people we want to run our councils and Government.		
4	We vote for Members of Parliament (MP's). Elections take place at least once every 5 years.		
5	In our democracy there are political parties. At the time of writing the political party who has the majority of MP's in Parliament is the Conservative Party. Labour are currently the opposition Party.	9	When elections take place for Members of Parliament, the public go to vote. Traditionally this happens on a Thursday, and people vote in a secret ballot. People only know who you vote for if you decide to tell them – it is rude to ask!
6	The Leader of the Conservatives and our current Prime Minister is Theresa May. The Leader of the Opposition is Jeremy Corbyn.	10	Where can I see British Values at School? Democracy – School Council / Form Representatives / Student Executive. We hold mock elections and in PSHE you will learn more about politics. We participate in the MAT debating competition, held in the council chamber at the Town Hall.
7	MP's debate in the Palace of Westminster, in the House of Commons. On the opposite side of the Building is the House of Lords. The House of Lords (unelected members) ratify law and policies put forward by parliament.		
The rule of law			
11	In the UK, we have laws which determine what is legal and illegal. You are expected to know the difference between right and wrong.	14	There are consequences for making the wrong choice or taking illegal actions. We all take responsibility for our actions.
12	The rule of law is a principle that individuals and institutions are subject and accountable to, which is fairly applied and enforced.	15	Where can I see British Values at School? Rule of Law – Our Behaviour Systems and Behaviour Policy. We have agreed rules and expectations so that our school is a safe and happy place where all differences are reconciled peacefully. We have a PCSO that comes into school to educate you in the law.
13	Those who commit crimes will ultimately be brought to justice through the legal system including Police officers, courts and lawyers. The rule of law acts as a deterrent, to deter people from criminal acts.		
Individual liberty			
16	In the UK you are free to have an opinion (unless it is extremist) and believe in what you want without discrimination.	18	Where can I see British Values at School? Mutual Respect – Our academy ethos, antibullying and assemblies. Boundaries are used to ensure you are safe.
17	You have the freedom to make choices and decisions without being judged.		
Mutual **respect** for and **tolerance** of those with different faiths and beliefs and for those without faith.			
19	Mutual Respect and Tolerance are the proper regard for an individuals' dignity, which is reciprocated, and a fair, respectful and polite attitude is shown to those who may be different to ourselves.	21	We should all actively challenge students, staff or parents expressing opinions contrary to the values we hold in society and as a school and those that underpin the fabric of a democratic Britain. This is crucial to us to protect one another and to tackle 'extremist' views and prevent people from being radicalised.
20	Differences in terms of faith, ethnicity, gender, sexuality, age, young carers and disability, are differences that should be respected, tolerated and celebrated.	22	Where can I see British Values at School? Acceptance of Faith – RE Lessons and Assemblies. We give you messages of tolerance and respect for others no matter what their ethnicity, beliefs, sexuality, gender or disability.

Democracy	Rule of Law	Individual Liberty	Mutual Respect	Tolerance