

YEAR 9 KNOWLEDGE ORGANISER

MICHAELMAS TERM



Name:

Family Group:



LEARNING - LOVING - LIVING

HOW TO USE MY KNOWLEDGE ORGANISER

The timetable shows the **subjects** you should be studying and the days that you should be studying them. You should **complete your work in your exercise book**.

Each evening you should draw a straight line (using a ruler), under the previous day's work, and write the date, clearly at the top. You need to **bring your KO and exercise book with you to school EVERYDAY**.

The **KO** work that you have completed for the week will be checked in Family Group time **EVERY** Friday. If homework is not of an appropriate standard or amount will result in an after school detention. Knowledge tests will also be used frequently in lessons.

SUBJECT HOMEWORK

Students will also be **given** additional subject homework to be completed throughout the week and/or can use FREE online revision tools such as www.senecalearning.com

It is also recommended that students regularly **READ** a variety of fiction and non fiction books that they choose for pleasure. This extra reading will help to develop and broaden their general knowledge.

In **ENGLISH** all students will be expected to complete 1-2 reading assignments each week by accessing www.CommonLit.org . Each assignment will take 20-30 minutes and students will be required to answer multiple choice questions to check their understanding of what they have read.

In **MATHS** students are expected to watch short explanation videos and complete activities on the online platform of <https://mathswatch.co.uk>. Students can log in using the details and password they use to log in to the school computers.

HOMEWORK TIMETABLE

You should spend *at least* **1 hour** per night on homework = 3 subjects x 20 minutes per subject

Year 9	Subject 1	Subject 2	Subject 3
Monday	Maths	Option A	Option C
Tuesday	English	Option B	Option C
Wednesday	Maths	Religious Education	English
Thursday	English	Science	Option A
Friday	Maths	Languages	Option B

RETRIEVAL ACTIVITY IDEAS

Knowledge organisers are for **learning and mastering** the knowledge in each subject. There are many different ways you can do this, however some **PROVEN** methods to try in your work book are:

4 Methods of Retrieval Practice

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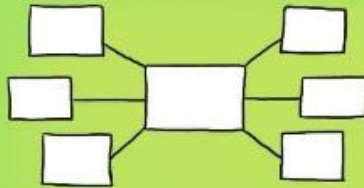
Before you start put away all your books & classroom materials.

Retrieval Practice Examples

- * Exit Tickets
- * Starter quizzes
- * Multiple choice quizzes
- * Short answer tests
- * Free write
- * Think, pair, share
- * Ranking & sorting
- * Challenge grids

BRAIN DUMP

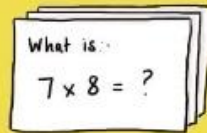
Write, draw a picture, create a mind-map on everything you know about a topic.



Give yourself a time limit, say 3 minutes, then have a look at your books & add a few things you forgot.

FLASHCARDS

Create your own flashcards, question on one side answer on the other. Can you make links between the cards?



You need to repeat the Q&A process for flashcards you fail on more frequently & less frequently for those you answer correctly

QUIZZING

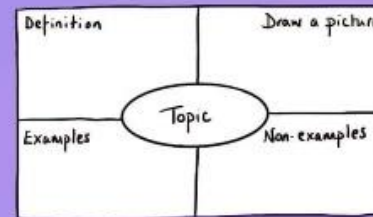
Create practice questions on a topic. Swap your questions with a partner & answer.

Question - What is a metaphor?

- A comparison using 'like, as, than'.
- A comparison where one thing is another.
- A comparison with a human attribute.

KNOWLEDGE ORGANISERS

Complete a knowledge organiser template for key information about a topic.



You can use knowledge organisers to learn new vocab & make links in between subjects or ideas.

After you have retrieved as much as you can go back to your books & check what you've missed. Next time focus on that missing information

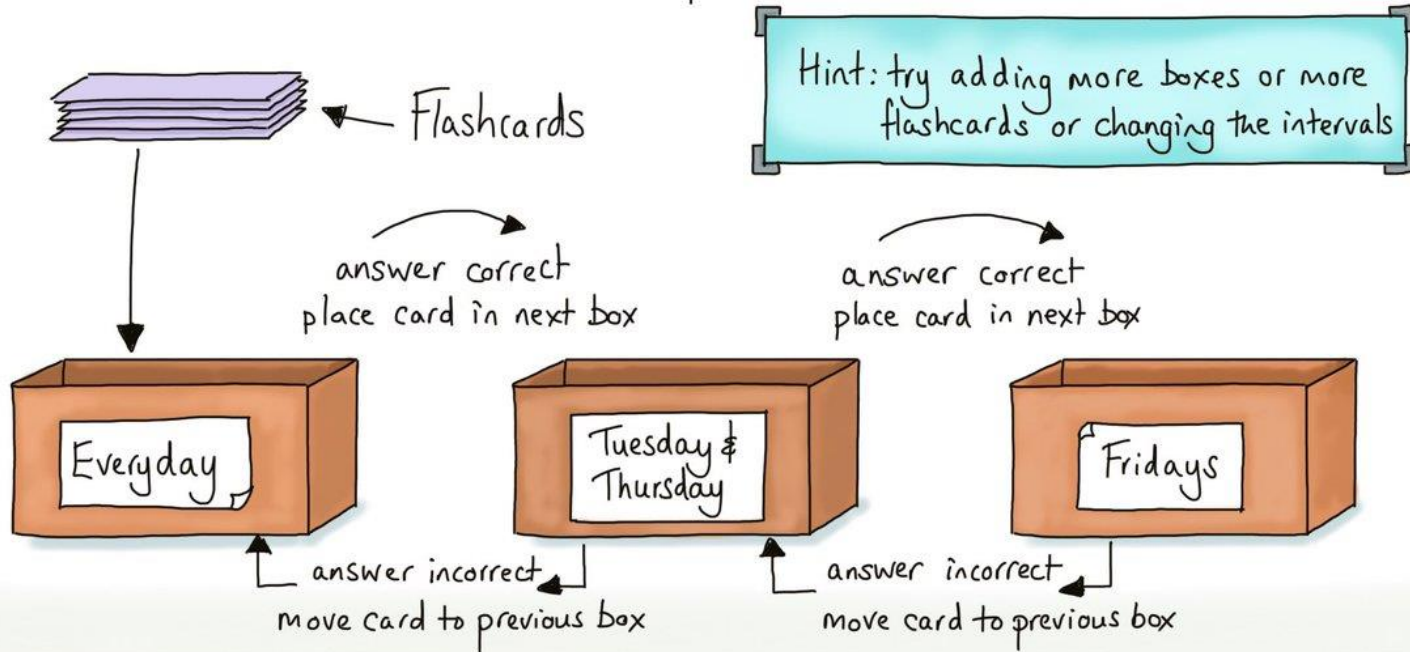
USING FLASH CARDS SUCCESSFULLY

Once flash cards are created, you will need to use them correctly to have an impact. Follow the method below for the best knowledge retention

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LEITNER Flash card method

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An effective use of flashcards to prompt & recall learning using spaced practice proposed by Leitner in the 1970s. It focuses on the proficiency of recall of the learner. Information which is easily recalled has a longer time lapse before the next recall opportunity.

	Term	Definition		Term	Definition
1	Sardonic (adj)	grimly mocking in tone	23	Scathing (adj)	severely critical and scornful
2	Personification (n) personify (v)	giving human qualities to something not human	24	Visceral (adj)	something you feel in your gut
3	Symbolise (v) Symbolic (adj)	when something represents something else	25	Abhorrent (adj) Abhorrent (n)	inspiring disgust or hatred
4	Incongruity (n) incongruous (adj)	when things don't fit or lack harmony	26	Despondent (adj) Despondence (n)	in low spirits, desperate
5	Jingoism (n) Jingoistic (adj)	Extreme or aggressive patriotism	27	Baleful (adj)	dangerous and threatening
6	Demotic (adj)	denoting or relating to the kind of language used by ordinary people; colloquial.	28	Disconcerting (adj)	causing one to feel unsettled
7	Epizeuxis (n)	repetition of a word in immediate succession	30	Sombre (adj)	having or conveying a feeling of deep seriousness and sadness.
8	1776-1783	American Revolution (American fights Britain)	31	Sanctimonious (adj)	thinking you are morally superior to others
9	1860	Abraham Lincoln elected President of USA	32	Mundane (adj)	boring and tedious
10	1863	Gettysburg Address	33	Elated (adj) Elation (n)	extremely happy
11	1861-1865	American Civil War	34	Macabre (adj)	disturbing because concerned with death or fear of death
12	1899-1902	Boer War (South Africa)	35	Inevitable (adj) inevitability (n)	certain to happen, unavoidable
13	1914-1918	World War One	36	Insurrection	a violent uprising against a government or King
14	1939-1940	World War Two	37	Denounce (v) denunciation (n)	to publicly criticise
15	Repugnant (adj) Repugnance (n)	Disgusting and offensive	38	Tenacious (adj) tenacity (n)	determined
16	Motif (n)	Common idea repeated across a text	39	Significant (adj) significance (n)	important or worthy of attention
17	Ubiquity (n) Ubiquitous (adj)	Found everywhere, commonplace	40	Resolute (adj)	determined
18	Parody (n)	Copying in a hyperbolic or mocking fashion for comic effect	41	Ostracise (v) ostracisation (n)	Exclude from society or group
19	Frivolous (adj) frivolity (n)	not having any serious value or purpose	42	Ignominy (n) ignominious (adj)	Public shame and humiliation
20	Apathy (n) Apathetic (adj)	lack of interest, concern or care	43	Dehumanise (v) dehumanization (n)	Treat someone like an object
21	Profound (n) Profundity (n)	very great, intense or important	44	Grotesque (adj)	Repulsive and ugly, perhaps comically ugly

	Term	Definition		Term	Definition
45	Poignant (adj) Poignancy (n)	Evoking a keen sense of sadness or regret	62	Judicious (adj) Judiciously (adj)	Really carefully
46	Nihilistic (adj) Nihilism (n)	Thinking that life is meaningless and pointless	63	Shrewd (adj)	Having sharp powers of judgment
47	Deride (v) derision (n) derisive (adj)	Expressing contempt or ridicule	64	Paeon (n)	A song of praise or triumph
48	Indignance (n) Indignant (adj)	Angered or appalled by something unjust or cruel	65	Illicit (adj)	Against the law, illegal
49	Disconcert (v) disconcerting (adj)	Causing one to feel unsettled or on edge	66	Impediment (n) Impede (v)	To delay or prevent or obstruct something from happening
50	Inhumane (adj) Inhumanity (n)	Cruel or brutal behavior	67	Bathos (n)	An effect of anticlimax when the mood of a text changes from serious to silly or vice versa
51	Serene (adj) serenity (n)	Calm, peaceful, tranquil	68	Colloquialism (n) colloquial (adj)	Familiar or everyday language: slang
52	Emancipate (v) emancipation (n)	Set free, especially from legal, political or social restrictions	69	Forlorn (adj)	Pitifully sad or lonely
53	Benign (adj)	Gentle and kind	70	Dank (adj)	Unpleasantly damp and cold
54	Demagogue (n)	A political leader who appeals to popular desires and prejudices	71	Triviality (n) Trivial (adj)	Of little value or importance
55	Zeal (n) Zealous (adj)	Great enthusiasm and enjoyment and commitment to doing something	72	Condemn (v) condemnation (n)	Very strong disapproval
56	Magnitude (n)	The size and scale of something	73	Pay homage to (v)	To show respect to someone
57	Momentous (adj)	Of great importance or significance	74	Secular (adj)	Not religious
58	Sanguine (adj)	Optimistic and positive, especially in a bad situation	75	Apprehensive (adj) Apprehension (n)	anxious or fearful that something bad or unpleasant will happen.
59	Unequivocal (adj)	Leaving no doubt, unambiguous	76	Repress (v) Repression (n) repressive (adj)	Using force to control people in a cruel manner
60	Subjugate (v) Subjugation (n)	To bring under control or dominate someone in an unfair or cruel manner	77	Odious (adj)	Unpleasant
61	Scourge (n)	A person or thing that causes great suffering	78	Elaborate (adj)	Complicated in design and planning

Important Ideas

Keep Flip Change

$$\frac{4}{7} \div \frac{2}{5} = \frac{4}{7} \times \frac{5}{2} = \frac{10}{7} = 1\frac{3}{7}$$

The Percentage Multiplier
Turn the percentage into a fraction or a decimal
 E.g. $5\% = \frac{5}{100} = 0.05$

Compound Growth and Decay
 This topic is simple if you [LEARN THIS FORMULA](#). If you don't, it's pretty well impossible:

$$N = N_0 \times (\text{multiplier})^n$$

Amount after n days/hours/years → N ← Number of days/hours/years
 Initial amount → N_0 ← Percentage change multiplier
 E.g. 5% increase is 1.05 (= 1 + 0.05)
 26% decrease is 0.74 (= 1 - 0.26)

Vocabulary

Equivalent fractions	Fractions which are equal in value
Reciprocal of a number	1 divided by that number. In other words when you swap the numerator for the denominator.
Variable or unknown	A letter or symbol used to represent a number; it can take any value
Like terms	Separate parts of an expression which have exactly the same variable and same powers
Expression	Made up of numbers and/or letters but no equal sign
Equation	Contains an 'equal' sign and at least one variable

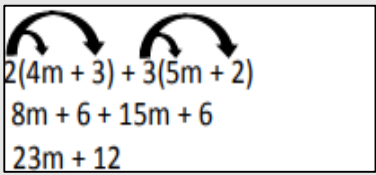
QUESTION ANSWER

PERCENTAGE INCREASE Increase £400 by 12%	10% = £40 and 1% = £4 So 12 percent = £40 + £4 + £4 = £48 Total = £400 + £48 = £448
MIXED NUMBER ADDITION $1\frac{3}{5} + 2\frac{1}{3} =$	$\frac{8}{5} + \frac{7}{3} = \frac{24}{15} + \frac{35}{15} = \frac{59}{15} = 2\frac{14}{15}$
PERCENTAGE CHANGE There used to be 20 pencils in a pack, now there are only 15. Calculate the percentage change	$\frac{20 - 15}{20} \times 100 = \frac{5}{20} \times 100 = 25\%$ Answer 20% decrease
REVERSE PERCENTAGE A house increased in value by 20%. It is now worth £240,000. What was the original cost?	120% = £240,000 20% = £40,000 100% = £100,000

MathsWatch References

70-74	The four operations with fractions
111. 164	Simple & compound interest
95	Substitution
135,137	Forming and solving equations
94, 157	Factorising & Solving Quadratics

Key Facts & Formula

Simple Interest vs Compound Interest	Simple Interest (SI) is the same amount added on for each time period. SI = Principal x interest rate (decimal) x time Compound interest (CI) you pay interest in the interest earned in previous years
Expand & Simplify	 $2(4m + 3) + 3(5m + 2)$ $8m + 6 + 15m + 6$ $23m + 12$
Factorise	<p>Factorise $6x^2 - 9x$</p> <p>The factorised expression is $3x(2x - 3)$.</p>
Substitute	<p>The velocity of a car is given by $v = u + at$, find value of v when $u=10$, $a=-2$ and $t=4$</p> $v = u + at$ $v = 10 + -2 \times 4$ $v = 10 - 8$ $v = 2$
Solve	$5e - 1 = 3e + 6$ <p>STEP 1: Subtract $3e$ $-3e$ $-3e$</p> $2e - 1 = 6$ <p>STEP 2: Add 1 $+1$ $+1$</p> $2e = 7$ <p>STEP 3: Divide by 2 $\div 2$ $\div 2$</p> $e = 3.5$

Application of Methods

Convert a mixed number into an improper fraction.

$$4 \frac{3}{5} = \frac{4 \times 5 + 3}{5} = \frac{23}{5}$$

Mixed Number

$$\frac{\text{Whole number} \times \text{denominator} + \text{numerator}}{\text{Original denominator}}$$

Convert an improper fraction in mixed number...

$$\frac{13}{3} \div 3 = 4 \text{ remainder } 1 \text{ over } 3 = 4 \frac{1}{3}$$

Improper Fraction

Step 1: Work out how many denominators fit into the numerator exactly
Step 2: Leave the remainder over the original denominator.

Step 1: Turn the number into a fraction
Step 2: Turn the fraction upside down.

Reciprocal

$$0.5 = \frac{1}{2} \quad \text{Reciprocal} = \frac{2}{1}$$

$$4 \frac{2}{3} \times 1 \frac{1}{4} = \frac{16}{3} \times \frac{5}{4} = \frac{90}{12}$$

To add/subtract/multiply or divide mixed numbers you...

Step 1: Change both fractions into improper fractions
Step 2: Calculate a normal.

To change a recurring decimal to a fraction you...

Step 1: Name the decimal X.
Step 2: Eliminate the recurring element by subtraction.
Step 3: Make X the subject of the remaining elements to find the fractional equivalent of the original decimal.

$$\begin{array}{r} 10X = 3.3\dot{3} \\ - \quad X = 0.3\dot{3} \\ \hline 9X = 3 \end{array} \quad \Rightarrow \quad X = \frac{3}{9} = \frac{1}{3}$$

Application of Methods

To calculate a percentage of an amount you...

Step 1: Turn the percentage into a decimal.
Step 2: Multiply the decimal by the original amount.

$$5.6\% \text{ of } \pounds 200 = 0.056 \times 200 = \pounds 11.20$$

To calculate compound interest you...

Step 1: Turn the percentage increase into a decimal and add this to one.
Step 2: The number of times you compound the interest becomes the power.

$$\text{Increase } \pounds 200 \text{ by } 6\% \text{ for } 4 \text{ years using compound interest.}$$

$$200 \times 1.06^4$$

To calculate compound decay you...

Step 1: Turn the percentage decrease into a decimal and subtract this from one.
Step 2: The number of times you compound the interest becomes the power.

$$\text{Decrease } \pounds 300 \text{ by } 12\% \text{ for } 5 \text{ years using compound decay.}$$

$$300 \times 0.88^5$$

To find an original value given a percentage change you...

Step 1: Write the new value with the percentage change taken into account.
Step 2: Work backwards to 100% (the original value) using proportional reasoning.

A car is increased by 20% and now costs £2400

$$\begin{array}{r} 120\% = 2400 \\ + 120 \downarrow \\ 1\% = 20 \downarrow \\ \times 100 \downarrow \\ 100\% = 2000 \end{array}$$

To work out value for money...

Step 1: Find out the value per unit in order to compare two deals directly using proportional reasoning.
Step 2: Write a conclusion in words using numbers as evidence to support your conclusion.

Deal 1

$$\begin{array}{r} \pounds 3 \text{ for } 4\text{kg} \\ + 4 \downarrow \\ \pounds 0.75 : 1\text{kg} \end{array}$$

Deal 2

$$\begin{array}{r} \pounds 5 \text{ for } 8\text{kg} \\ + 8 \downarrow \\ \pounds 0.625 : 1\text{kg} \end{array}$$

Deal 2 is better value for money as it is cheaper per kg since $0.625 < 0.75$

To work out the speed of an object you...

Step 1: Set up a ratio of distance versus time taken.
Step 2: Use proportional reasoning in order to make the time equal to 60 minutes.
Step 3: Remember speed is the distance travelled in one hour.

Work out the speed if you travel 24km in 80 minutes

$$\begin{array}{r} 24\text{km} : 80 \text{ minutes} \\ + 4 \downarrow \\ 6\text{km} : 20 \text{ mins} \\ \times 3 \downarrow \\ 18\text{km} : 60 \text{ mins} \end{array} \quad \Rightarrow \quad \text{Answer} = 18\text{kmph}$$

Vocabulary

Speed

kmph

The distance in km travelled in 60 minutes.

Density

g/cm^3

The weight of an object in grams per cubic centimeter.

Pressure

N/m^2

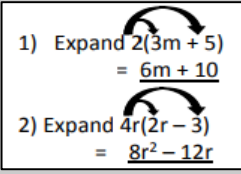
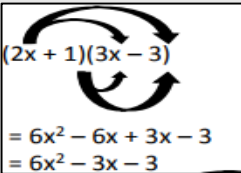
The force in Newton's per meter squared.

Proportional

There exists a multiplier between two linked values. E.g. as one triples so does the other so that they remain in proportion.

MathsWatch References

25	Equivalent Fractions
26	Simplifying Fractions
38 – 42	Ratio and Proportion
70-74	+/-/x/÷ Fractions
86-89	Basic percentages
106-111	Percentage change
156	Mathematical reasoning
164	Compound interest

Important Ideas		QUESTION	ANSWER	KEY FACTS AND FORMULA	
BIDMAS	Brackets Indices (also known as orders or powers) Division Multiplication Addition Subtraction	BIDMAS $3 \times 5 + (1 + 3)^2$	$= 3 \times 5 + (4)^2$ $= 15 + 16$ $= 31$	Simplifying	Simplify the following 1) $x + x + x + x + x = 5x$ 2) $5e - 2e + e = 4e$ 3) $4x + 2y - x + 5y + 6 = 3x + 7y + 6$ 4) $3x^2 + 5x + 2x^2 - 4x = 5x^2 + x$ 5) $5 \times 4g = 20g$ 6) $3b \times 4c = 12bc$
Like Terms	Like terms contain the exact same variables, raised to the exact same powers E.g. $2a^2b$ and $5a^2b$; but $7ab^2$ would not be considered a like term	SUBSTITUTION The velocity of a car is given by $v = u + at$, find value of v when $u=10$, $a = -2$ and $t=4$	$v = u + a \times t$ $v = 10 + -2 \times 4$ $v = 10 - 8$ $v = 2$		
Simplify	you collect together all the terms that are alike. Remember, each term comes with the sign in front of it	WRITING FORMULA Pencils cost 15p each and pens cost 25p each. Write a formula for the total cost, T pence, of x pencils and y pens.	Total cost = $15 \times x + 25 \times y$ $T = 15x + 25y$	Substitution	Evaluate $3a^2$ when $a = 5$ $3 \times 5^2 = 3 \times 25 = 75$ (Don't forget BIDMAS!)
Vocabulary		REARRANGING FORMULA		Expanding Brackets single brackets	
Variable	(or an <u>unknown</u>) is a letter used to represent a number, these can take any values	REARRANGING FORMULA Make r the subject of $C = 2\pi r$. $\frac{C}{2\pi} = r$	To isolate r , divide by 2π		
Terms	the separate parts of expressions. For example, in $5x + 3y - 4$, there are three terms $5x$, $+3y$ and -4	MathsWatch References		Expanding Quadratics	Expand and Simplify: 
Expressions	is made up numbers and/or letters representing unknown values where there is no equals symbol. For example, $4a + 6$ or $a + b$	30, 59 Number machines, BIDMAS 7, Introduction to algebraic convention			
Equations	contains an 'equals' sign and at least one variable. A value can be found for the variable and this is known as solving the equation	66 Substitution 34, 35 Simplifying expressions 102 Algebraic simplification		Rearranging Formula	Make x the subject of $y = \frac{x}{5} + 3$. To isolate x , start by subtracting 3 from both sides $y - 3 = \frac{x}{5}$ Then Multiply both sides of the equation by 5 $5(y - 3) = x$
Formula	is a special type of equation which is a rule for working things out such as area	136, 190	Rearranging Formulae		

Important Ideas

Equivalent Fractions

$\frac{1}{2}$ $\frac{2}{4}$ $\frac{8}{16}$

Keep Flip Change

÷ Dividing Fractions ÷

$\frac{3}{4} \div \frac{1}{6} = \frac{3}{4} \times \frac{6}{1} = \frac{18}{4} = 4 \frac{2}{4}$

Vocabulary

Fraction	A fraction represents a part of a whole or, more generally, any number of equal parts.
Ratio	A ratio is a numerical comparison of 2 or more quantities.
Metrics Units of Measurement	The metric system is a system of measuring based on the meter, liter, kilogram and second.
Imperial Units of Measurement	In the past, imperial units of measurement were used in the UK. The imperial system has gradually been replaced by the metric system, which is easier to understand as it deals with tens, hundreds and thousands.

Q&A

Mixed number addition $1\frac{3}{5} + 2\frac{1}{3} =$ Answer: $3\frac{14}{15}$	$\frac{8}{5} + \frac{7}{3} = \frac{24}{15} + \frac{35}{15} = \frac{59}{15} = 3\frac{14}{15}$
What is 50% of £84? Answer: £42	$\frac{50}{100} \times \frac{84}{1} =$ $\frac{1}{2} \times \frac{84}{1} = \frac{84}{2} = £42$
John has £50 to share between himself and his sister in the ratio 3:2 respectively. How much money should John get? Answer: £30	Total Parts: 3 + 2 = 5 METHOD 1 3 Parts: $\frac{3}{5} \times \frac{50}{1} = \frac{150}{5} = £30$ METHOD 2 One part: $\frac{50}{5} = £10$ 3 Parts: 3 x £10 = £30

MathsWatch References

Fractions	24, 25, 26, 70, 71a, 71b, 72, 73, 74, 84, 85
Percentage	85, 86, 87, 88, 89
Decimal	3, 17, 18, 66, 67, 84, 85
Conversion of Units	112

Key Facts

Units of Measurement		
	Metric	Imperial
Length	millimetre, centimetre, metre, kilometre	inch, foot, yard, mile
Mass	milligram, gram, kilogram	ounce, pound, stone
Capacity	millilitre, centilitre, litre	pint, gallon

Converting Fractions, Decimals, and Percents

Decimal to Fraction

1. Divide the numerator by the denominator.

$$\begin{array}{r} .25 \\ 4 \overline{) 1.00} \\ \underline{-8} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

2. Multiply by 100 or move the decimal point two places to the right.

 $0.25 \times 100 = 25.00$ or $.25 = 25$

3. Add the percent symbol. 25%

convert to

$\frac{1}{4}$

Fraction to Percent

1. Divide the numerator by the denominator.

$$\begin{array}{r} .25 \\ 4 \overline{) 1.00} \\ \underline{-8} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

2. Multiply by 100 or move the decimal point two places to the right.

 $0.25 \times 100 = 25.00$ or $.25 = 25$

3. Add the percent symbol. 25%

Percent to Decimal

1. Multiply by 100 or move the decimal point two places to the right.

 $0.75 \times 100 = 75.00$ or $0.75 = 75$

2. Add the percent symbol.

 $0.75 = 75\%$

convert to

0.75

Decimal to Fraction

1. Use the place value of the last digit to the right of the decimal point as the denominator.

 $0.75 = \frac{75}{100}$

2. Remove the decimal point and make that number the numerator.

 $0.75 = \frac{75}{100}$

3. Reduce the fraction to lowest terms.

 $\frac{75}{100} = \frac{3}{4}$

Fraction to Percent

1. Remove the percent symbol and make that number the numerator.

$$\begin{array}{r} 40 \\ 100 \overline{) 40} \\ \underline{-40} \\ 0 \end{array}$$

2. Use 100 as the denominator.

 $\frac{40}{100}$

3. Reduce the fraction to lowest terms.

 $\frac{40}{100} = \frac{2}{5}$

convert to

40%

Percent to Decimal

1. Remove the percent symbol.

 40

2. Divide by 100 or move the decimal point two places to the left.

 $\frac{40}{100} = 0.40$
 $40.0 = 0.40$

1. Atoms, elements and compounds

Atom	<i>The smallest part of an element that can exist</i>
Element	<i>Contains only one type of atom</i>
Compound	<i>Two or more elements chemically combined</i>

3. Separating mixtures

Mixtures	<i>Two or more elements or compounds not chemically combined together</i>	
Method	Description	
Filtration	<i>Separating an insoluble solid from a liquid</i>	
Crystallisation	<i>To separate a solid from a solution</i>	
Simple distillation	<i>To separate a solvent from a solution</i>	
Fractional distillation	<i>Separating a mixture of liquids each with different boiling points</i>	
Chromatography	<i>Separating substances that move at different rates through a medium</i>	

2. Chemical equations

Chemical equations	<i>Show chemical reactions - need reactant(s) and product(s) energy always involves and energy change</i>
Word equations	<i>Uses words to show reaction</i> reactants → products magnesium + oxygen → magnesium oxide
Symbol equations	<i>Uses symbols to show reaction</i> reactants → products $2Mg + O_2 \rightarrow 2MgO$

4. Atomic structure

Nucleus	Contains protons and neutrons	
Electron shells	Contains electrons	
Name of Particle	Relative Charge	Relative Mass
Proton	+1	1
Neutron	0	1
Electron	-1	Very small

5. Electronic structure

Electronic shell	Max number of electrons
1	2
2	8
3	8
4	2

6. History of the atomic model

Rutherford's scattering experiment	<p><i>A beam of alpha particles are directed at a very thin gold foil</i></p>	<p>Most of the alpha particles passed right through. A few (+) alpha particles were deflected by the positive nucleus.</p> <p>A tiny number of particles reflected back from the nucleus.</p>
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Pre 1900	<i>Tiny solid spheres that could not be divided</i>	Before the discovery of the electron, John Dalton said the solid sphere made up the different elements.
1897 'plum pudding'	<i>A ball of positive charge with negative electrons embedded in it</i>	JJ Thompson 's experiments showed that showed that an atom must contain small negative charges (discovery of electrons).
1909 nuclear model	<i>Positively charge nucleus at the centre surrounded negative electrons</i>	Ernest Rutherford's alpha particle scattering experiment showed that the mass was concentrated at the centre of the atom.
1913 Bohr model	<i>Electrons orbit the nucleus at specific distances</i>	Niels Bohr proposed that electrons orbited in fixed shells; this was supported by experimental observations.

7. The periodic table		
Mass number	<i>The sum of the protons and neutrons in the nucleus</i>	
Atomic number	<i>The number of protons in the atom</i>	Number of electrons = number of protons
Elements arranged in order of atomic number	<i>Elements with similar properties are in columns called groups</i>	Elements in the same group have the same number of outer shell electrons and elements in the same period (row) have the same number of electron shells.

8. Development of the periodic table		
Before discovery of protons, neutrons and electrons	<i>Elements arranged in order of atomic weight</i>	Early periodic tables were incomplete, some elements were placed in inappropriate groups if the strict order atomic weights was followed.
Mendeleev	<i>Left gaps for elements that hadn't been discovered yet</i>	Elements with properties predicted by Mendeleev were discovered and filled in the gaps. Knowledge of isotopes explained why order based on atomic weights was not always correct.

9. Group 1 – Alkali metals		
Alkali metals	<i>Very reactive with oxygen, water and chlorine</i>	Only have one electron in their outer shell. Form +1 ions.
	<i>Reactivity increases down the group</i>	Negative outer electron is further away from the positive nucleus so is more easily lost.

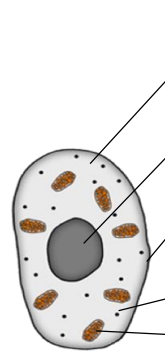
10. Group 7 – Halogens		
Halogens	<i>Consist of molecules made of a pair of atoms</i>	Have seven electrons in their outer shell. Form -1 ions.
	<i>Melting and boiling points increase down the group (gas → liquid → solid)</i>	Increasing atomic mass number.
	<i>Reactivity decreases down the group</i>	Increasing proton number means an electron is more easily gained

11. Group 0 – Noble gases		
Noble gases	<i>Unreactive, do not form molecules</i>	This is due to having full outer shells of electrons.
	<i>Boiling points increase down the group</i>	Increasing atomic number.

12. Transition metals (CHEMISTRY ONLY)	
Compared to group 1	<ul style="list-style-type: none"> • <i>Less reactive</i> • <i>Harder</i> • <i>Denser</i> • <i>Higher melting points</i>
Typical properties	<ul style="list-style-type: none"> • <i>Many have different ion possibilities with different charges</i> • <i>Used as catalysts</i> • <i>Form coloured compounds</i>

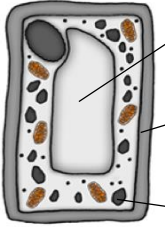
1. Eukaryote and prokaryote cells

Animal cells



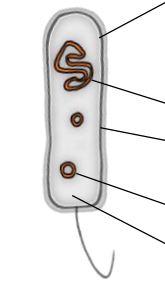
cytoplasm	<i>site of chemical reactions in the cell</i>	gel like substance containing enzymes to catalyse the reactions
nucleus	<i>contains genetic material</i>	controls the activities of the cell and codes for proteins
cell membrane	<i>semi permeable</i>	controls the movement of substances in and out of the cell
ribosome	<i>site of protein synthesis</i>	mRNA is translated to an amino acid chain
mitochondrion	<i>site of respiration</i>	where energy is released for the cell to function

Plant cells contains all the parts of animal cells plus extras



permanent vacuole	<i>contains cell sap</i>	keeps cell turgid, contains sugars and salts in solution
cell wall	<i>made of cellulose</i>	supports and strengthens the cell
chloroplast	<i>site of photosynthesis</i>	contains chlorophyll, absorbs light energy

Bacterial cells are much smaller than plant and animal cells



cell membrane	<i>site of chemical reactions in the cell</i>	gel like substance containing enzymes to catalyse the reactions
bacterial DNA	<i>not in nucleus floats in the cytoplasm</i>	controls the function of the cell
cell wall	NOT made of cellulose	supports and strengthens the cell
plasmid	<i>small rings of DNA</i>	contain additional genes
cytoplasm	<i>semi permeable</i>	controls the movement of substances in and out of the cell

2. Microscopes

Feature	Light (optical) microscope	Electron microscope
Radiation used	Light rays	Electron beams
Max magnification	~ 1500 times	~ 2 000 000 times
Resolution	200nm	0.2nm
Size of microscope	Small and portable	Very large and not portable
Cost	~£100 for a school one	Several £100,000 to £1 million plus

PREFIXES

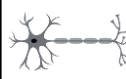


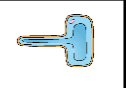
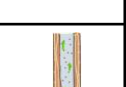
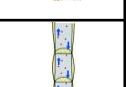
Prefix	Multiple	Standard form
centi (cm)	1 cm = 0.01 m	$\times 10^{-2}$
milli (mm)	1 mm = 0.001 m	$\times 10^{-3}$
micro (µm)	1 µm = 0.000 001 m	$\times 10^{-6}$
nano (nm)	1nm = 0.000 000 001 m	$\times 10^{-9}$

magnification $M = \frac{\text{size of image}}{\text{real size of the object}}$

3. Cell cycle

Stage 1	Growth	Increase the number of sub-cellular structures e.g. ribosomes and mitochondria.
Stage 2	DNA Synthesis	DNA replicates to form two copies of each chromosome.
Stage 3	Mitosis	One set of chromosomes is pulled to each end of the cell and the nucleus divides. Then the cytoplasm and cell membranes divide to form two cells that are identical to the parent cell.

4. Cell differentiation

nerve		carry electrical signals	long branched connections and insulating sheath
sperm		fertilise an egg	streamlined with a long tail acrosome containing enzymes large number of mitochondria
muscle		contract to allow movement	contains a large number of mitochondria long
root hair		absorb water and minerals from soil	hair like projections to increase the surface area
xylem		carry water and minerals	TRANSPIRATION - dead cells cell walls toughened by lignin flows in one direction
phloem		carry glucose	TRANSLOCATION - living cells have end plates with holes flows in both directions

5. Cancer

Benign tumour	Contained in one area of the body (usually by a membrane) – not cancer.
Malignant tumour	Invade tissues and spread to different parts of the body to form secondary tumours.

Carcinogens and ionising radiation increase the risk of cancer by changing/ damaging DNA

6. Stem cells

Divides to form more cells of the same type, and can differentiate to form many other cell types.

Human Embryonic stem cells	<i>Can be cloned and made to differentiate into most cell types</i>	Therapeutic cloning uses same genes so the body does not reject the tissue. Can be a risk of infection
Adult bone marrow stem cells	<i>Can form many types of human cells e.g. blood cells</i>	Tissue is matched to avoid rejection, risk of infection. Only a few types of cells can be formed.
Meristems (plants)	<i>Can differentiate into any plant cell type throughout the life of the plant.</i>	Used to produce clones quickly and economically, e.g. rare species, crop plants with pest /disease resistance

Treatment with stem cells may be able to help conditions such as diabetes and paralysis. Some people object to the use of stem cells on ethical or religious grounds

7. Respiration for energy

Cellular respiration is an **exothermic** reaction which is continuously occurring in all living cells

An organism will receive all the energy it needs for living processes as a result of the energy transferred from respiration	For movement	To enable muscles to contract in animals.
	For keeping warm	To keep a steady body temperature in a cold environment.
	For chemical reactions	To build larger molecules from smaller one.

Volcanic Hazards

Ash cloud	Small pieces of pulverised rock and glass which are thrown into the atmosphere.
Gas	Sulphur dioxide, water vapour and carbon dioxide come out of the volcano.
Lahar	A volcanic mudflow which usually runs down a valley side on the volcano.
Pyroclastic flow	A fast moving current of super-heated gas and ash (1000°C). They travel at 450mph.
Volcanic bomb	A thick (viscous) lava fragment that is ejected from the volcano.

Convection Currents

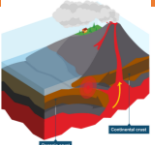
The crust is divided into tectonic plates which are moving due to convection currents in the mantle.

- Radioactive decay of some of the elements in the core and mantle generate a lot of heat.
- When lower parts of the mantle molten rock (Magma) heat up they become **less dense** and **slowly rise**.
- As they move towards the top they cool down, become **more dense** and **slowly sink**.
- These **circular movements** of semi-molten rock are **convection currents**
- Convection currents create **drag** on the base of the tectonic plates and this causes them to move.

Types of Plate Margins

Destructive Plate Margin

When the denser plate subducts beneath the other, friction causes it to **melt and become molten magma**. The magma forces its way up to the surface to form a volcano. This margin is also responsible for **devastating earthquakes**.



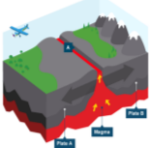
Constructive Plate Margin

Here two plates are **moving apart** causing new magma to reach the surface through the gap. Volcanoes formed along this crack cause a submarine mountain range such as those in the **Mid Atlantic Ridge**.



Conservative Plate Margin

A conservative plate boundary occurs where plates **slide past each other** in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones happening along the San Andreas Fault, USA.



The structure of the Earth

The Crust	Varies in thickness (5-10km) beneath the ocean. Made up of several large plates.
The Mantle	Widest layer (2900km thick). The heat and pressure means the rock is in a liquid state that is in a state of convection.
The Inner and outer Core	Hottest section (5000 degrees). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.

Managing Volcanic Eruptions

Warning signs		Monitoring techniques	
Small earthquakes are caused as magma rises up.	Temperatures around the volcano rise as activity increases.	Seismometers are used to detect earthquakes.	Thermal imaging and satellite cameras can be used to detect heat around a volcano.
When a volcano is close to erupting it starts to release gases.		Gas samples may be taken and chemical sensors used to measure sulphur levels.	
Preparation			
Creating an exclusion zone around the volcano.	Having an emergency supply of basic provisions, such as food	Being ready and able to evacuate residents.	Trained emergency services and a good communication system.

LIC -CS: Haiti Earthquake 2010

Causes On a conservative plate margin, involving the Caribbean & North American plates. The magnitude 7.0 earthquake was only 15 miles from the capital Port au Prince. With a very shallow focus of 13km deep .	
Effects 230,000 people died and 3 million affected. Many emotionally affected . 250,000 homes collapsed or were damaged. Millions homeless . Rubble blocked roads and shut down ports.	Management Individuals tried to recover people. Many countries responded with appeals or rescue teams . Heavily relied on international aid , e.g. \$330 million from the EU. 98% of rubble remained after 6 months .

What is a Natural Hazard

A natural hazard is a natural process which could cause death, injury or disruption to humans, property and possessions.

Geological Hazard	Meteorological Hazard
These are hazards caused by land and tectonic processes.	These are hazards caused by weather and climate.

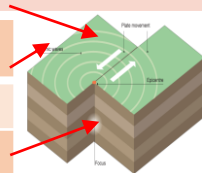
Causes of Earthquakes

Earthquakes are caused when two plates become **locked** causing **friction** to build up. From this **stress**, the **pressure** will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of **seismic waves**, to travel from the **focus** towards the **epicentre**. As a result, the crust vibrates triggering an earthquake.

The point directly above the focus, where the seismic waves reach first, is called the **EPICENTRE**.

SEISMIC WAVES (energy waves) travel out from the focus.

The point at which pressure is released is called the **FOCUS**.



Earthquake Management

PREDICTING

- Methods include:**
- Satellite surveying (tracks changes in the earth's surface)
 - Laser reflector (surveys movement across fault lines)
 - Radon gas sensor (radon gas is released when plates move so this finds that)
 - Seismometer
 - Water table level (water levels fluctuate before an earthquake).
 - Scientists also use seismic records to predict when the next event will occur.

PROTECTION

You can't stop earthquakes, so earthquake-prone regions follow these three methods to reduce potential damage:

- Building earthquake-resistant buildings
- Raising public awareness
- Improving earthquake prediction

HIC - CS: Eyjafjallajökull (E15) Eruption, Iceland 2010

Causes
The North-American and Eurasian plates move apart on a constructive plates.

The disruption caused by Eyjafjallajökull was the result of a series of small volcanic eruptions from March to October.

Effects
The **thick ice cap** melted which caused major flooding. **No reported deaths**. Airspace closed across Europe, with at least **17,000 flights** cancelled. Costed insurers **£65m** to cancelled flights.

Management
Iceland had a good warning system with **texts being sent** to residents within **30 minutes**. Large sections of **European airspace were closed** down due ash spread over the continent. Airlines developed **ash monitoring equipment**.

YEAR 9 — MICHAELMAS TERM- GEOGRAPHY — HAZARDOUS EARTH

Global pattern of air circulation

Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.

Hadley cell	Largest cell which extends from the Equator to between 30° to 40° north & south .
Ferrel cell	Middle cell where air flows poleward between 60° & 70° latitude.
Polar cell	Smallest & weakest cell that occurs from the poles to the Ferrel cell.

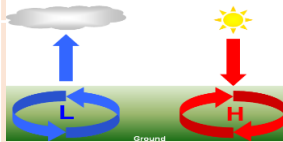
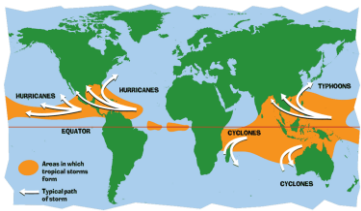


Distribution of Tropical Storms.

High and Low Pressure

They are known by many names, including hurricanes (North America), cyclones (India) and typhoons (Japan and East Asia). They all occur in a band that lies roughly 5-15° either side of the Equator.

Low Pressure	High Pressure
Caused by hot air rising. Causes stormy, cloudy weather.	Caused by cold air sinking. Causes clear and calm weather.



Formation of Tropical Storms

- The sun's rays heats large areas of ocean in the summer and autumn. This causes **warm, moist air** to rise over the particular spots
- Once the **temperature is 27°**, the rising warm moist air leads to a **low pressure**. This eventually turns into a thunderstorm. This causes air to be sucked in from the **trade winds**.
- With trade winds blowing in the opposite direction and the rotation of earth involved (Coriolis effect), the thunderstorm will eventually start to **spin**.
- When the storm begins to **spin faster than 74mph**, a tropical storm (such as a hurricane) is officially born.
- With the tropical storm growing in power, **more cool air sinks** in the centre of the storm, creating calm, clear condition called the **eye of the storm**.
- When the tropical storm hits land, it **loses its energy source** (the warm ocean) and it begins to lose strength. Eventually it will 'blow itself out'.

Changing pattern of Tropical Storms

Scientists believe that global warming is having an impact on the **frequency and strength of tropical storms**. This may be due to an **increase in ocean temperatures**.

Management of Tropical Storms

Protection Preparing for a tropical storm may involve construction projects that will improve protection.	Aid Aid involves assisting after the storm, commonly in LIDs.
Development The scale of the impacts depends on the whether the country has the resources cope with the storm.	Planning Involves getting people and the emergency services ready to deal with the impacts.
Prediction Constant monitoring can help to give advanced warning of a tropical storm	Education Teaching people about what to do in a tropical storm.

Primary Effects of Tropical Storms

- The intense winds of tropical storms can destroy whole **communities, buildings and communication networks**.
- As well as their own destructive energy, the winds can generate abnormally high waves called **storm surges**.
- Sometimes the most destructive elements of a storm are these subsequent **high seas and flooding** they cause to coastal areas.

Secondary Effects of Tropical Storms

- People are **left homeless**, which can cause distress, poverty and ill health due to lack of shelter.
- Shortage of clean water and lack of proper sanitation** makes it easier for diseases to spread.
- Businesses are damaged** or destroyed causing employment.
- Shortage of food as **crops are damaged**.

Case Study: Typhoon Haiyan 2013

Causes
Started as a tropical depression on **2nd November 2013** and gained strength. Became a Category 5 "**super typhoon**" and made landfall on the Pacific islands of the Philippines.

Effects	Management
<ul style="list-style-type: none"> Almost 6,500 deaths. 130,000 homes destroyed. Water and sewage systems destroyed had caused diseases. Emotional grief for dead. 	<ul style="list-style-type: none"> The UN raised £190m in aid. USA & UK sent helicopter carrier ships deliver aid remote areas. Education on typhoon preparedness.

Case Study: UK Heat Wave 2003

Causes
The heat wave was caused by an anticyclone (areas of high pressure) that stayed in the area for most of August. This blocked any low pressure systems that normally brings cooler and rainier conditions.

Effect	Management
<ul style="list-style-type: none"> People suffered from heat strokes and dehydration. 2000 people died from causes linked to heatwave. Rail network disrupted and crop yields were low. 	<ul style="list-style-type: none"> The NHS and media gave guidance to the public. Limitations placed on water use (hose pipe ban). Speed limits imposed on trains and government created 'heatwave plan'.

What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years.

Recent Evidence for climate change.

Global temperature	Average global temperatures have increased by more than 0.6°C since 1950 .
Ice sheets & glaciers	Many of the world's glaciers and ice sheets are melting. E.g. the Arctic sea ice has declined by 10% in 30 years .
Sea Level Change	Average global sea level has risen by 10-20cms in the past 100 years. This is due to the additional water from ice and thermal expansion.

Enhanced Greenhouse Effect

Recently there has been an increase in **humans burning fossil fuels** for energy. These fuels (gas, coal and oil) emit **greenhouse gases**. This is making the Earth's atmosphere thicker, therefore trapping more solar radiation and causing **less to be reflected**. As a result, the Earth is becoming warmer.

Evidence of natural change

Orbital Changes	Some argue that climate change is linked to how the Earth orbits the Sun, and the way it wobbles and tilts as it does it.
Sun Spots	Dark spots on the Sun are called Sun spots. They increase the amount of energy Earth receives from the Sun.
Volcanic Eruptions	Volcanoes release large amounts of dust containing gases . These can block sunlight and results in cooler temperatures.

Managing Climate Change

Carbon Capture This involves new technology designed to reduce climate change.	Planting Trees Planting trees increase the amount of carbon is absorbed from atmosphere.
International Agreements Countries aim to cut emissions by signing international deals and by setting targets.	Renewable Energy Replacing fossil fuels based energy with clean/natural sources of energy.

Anglo Saxon Crime and Punishment	
1	Crime and Punishment were dealt with by local communities with some involvement of the King and the Church. In 1066 a dramatic change occurred in England when William of Normandy invaded. The new regime sparked challenges to government authority. As the medieval period continued, the growth of towns led to a rise in crime rates in some areas. This prompted new ideas about law enforcement. Throughout this period, the church played an important part in defining and enforcing the law.
Key events	
2	954 – English kingdoms unite under one king.
3	1066 – William I is crowned King of England.
4	1066-1087 – Resistance to William’s rule was put down brutally.
5	1072 – Forest Laws are introduced.
6	1086 – Domesday Book.
7	1154 – Henry II became King.
6	1164 – Constitutions of Clarendon. Henry II reorganised the courts and set up prisons for those awaiting trial.
8	1194 – Coroners are introduced.
9	1215 – Trial by ordeal ends.
10	1348 – Black Death reaches England.
11	1485 – Henry Tudor becomes King Henry V11.
Key Concepts	
12	Rural population – 90% of people lived in the countryside.
13	During the Anglo-Saxon period, the power and influence of the King over crime and punishment grew . The role of the Catholic Church grew too and they wanted to give criminals opportunities to save their souls. The use of punishments, including capital punishment, grew .
15	Under the Normans, systems were centralised . This was a way of boosting the visible power of the King.
16	In the later Middle Ages, there was a shift away from local communities dealing with crime in their area towards a system where crime was dealt with by government appointed officials .
17	The church was an extremely powerful institution which controlled people’s thought and actions.

Key Words		
18	King’s Peace	Anglo-Saxons believed that it was the King’s duty to take care of law and order, so people could go about their everyday lives knowing that the law would be upheld.
19	Anglo-Saxon social structure	King, nobles, freemen and serfs.
20	Treason	Betraying the King – for example, by helping his enemies, or plotting to kill or replace him.
21	Crimes against the person	Crimes like assault or murder that cause physical harm to another person.
22	Crimes against property	Crimes like theft, robbery and arson, that involve taking or damaging something that belongs to another person.
23	Collective responsibility	Being responsible for the actions of other members of your group. In a village community if someone broke the law, it was up to everyone in the village to take action.
24	Reeve	A local official, appointed from the community.
25	Abbeys	Communities of monks or nuns.
26	Moral crimes	Actions that didn’t physically harm anyone, or their property, but didn’t match up to society’s views on decent behaviour: for example, having sex outside of marriage, or not sticking to the rules and customs of the church.
27	King’s shire reeve	A man who was appointed locally to bring criminals to justice. The term ‘shire reeve’ later turned into the word ‘sheriff’.
28	Tithing	Made up of 10 men over the age of 12. All were responsible for the behaviour of each other. One man from each tithing had to meet regularly with the shire reeve.
29	Hue and cry	Shouting for help if a crime had been committed. Everyone who heard it was expected to bring chase and capture the suspects.
30	Petty theft	Stealing small, low value items.
31	Maiming	Causing physical harm. A criminal could be punished by having a hand or ear cut off, or their tongue cut out.
32	Oath	A formal declaration of the facts, calling on God to witness that what is said is true.
33	Trial by ordeal	A way of testing whether the accused was innocent or guilty in the eyes of God.
34	Trial by hot iron/ hot water	Heat was used to burn one of the accused’s hands which was then bandaged. If the burn healed well, the accused was innocent.
35	Trial by cold water	The accused was thrown into cold water with their arms tied. Anyone who floated was judged guilty.
36	Wergild	Fines paid to the victim’s family. For murder. How much was determined by social status.
37	Capital punishment	The death penalty
38	Corporal Punishment	A range of punishments that caused harm or pain to the body – including being beaten or having body parts removed.
39	Retribution	A severe punishment, meant to match the severity of the crime.
40	Deterrent	A punishment that is frightening or painful and designed to put other people off committing the same crime.
41	Stocks and pillory	The pillory secured the arms and neck. The stocks secured the ankles. In full view, in bad weather for days on end, rubbish would be thrown at the accused and verbal abuse.
42	Castles	Built by the Normans to keep a careful watch on communities and to look intimidating.
43	Feudal system	Everybody owed money or service to the class above them.
44	Murdrum	If the murderer was not found, then a large sum of money had to be paid by the hundred where the body was found.
45	Forest Law	All common land was now strictly controlled by the King.
46	Poaching	Illegal hunting on land that belongs to someone else.
47	Outlaw	Any man aged 14 and over who tried to avoid trial and punishment by running away from his community. They could be killed without any legal consequences for the person responsible.
48	Folville gang	A group of upto 50 outlaws who operated in England in the C14th.
49	King’s mund	All men under the Normans should expect to live safe from crime under the authority of the King.
50	Brand	Make a mark on a criminal by burning their flesh with hot iron. They would now permanently stand out as a criminal.
51	Trial by combat	The two combatants fought to the death or until one gave in. It was usually used to settle disputes over money or land.
52	Statute of Labourers	Made it a crime to ask for higher wages.
53	Heresy	Made disagreeing with the teachings of the church a crime.
54	Secular	Non religious
55	Clergy	People who work for the church including priests.
56	High treason	Plotting to kill or betray the King.
57	Hanged, drawn and quartered	Semi strangled, then revived, abdomen cut open, intestines drawn out and limbs severed and displayed.
58	Banished	Ordered to leave the country.
59	Trial of consecrated bread	The priest had to pray and ask that when he ate a piece of consecrated bread, the bread would choke him if he lied about the crime of which he was accused.

Early Modern England Crime and Punishment

1 Between c.1500-c.1700, there were wide ranging social, religious and political changes in England. Religion became more volatile after Henry VIII's divorce. Many religious activities were now viewed as religious crimes. The Gunpowder Plot increased fears around religious conflict in England. The English Civil Wars also led to great instability. The C17th saw persecution for witchcraft and during this period, the ruling elite continued to use the law to protect their own position in society. Punishment became harsher and more varied.

Key events	
2	1509-47 – Reign of Henry VIII.
3	1547-53 – Reign of Edward VI.
4	1547 – Vagrancy Act – An able bodied vagabond who was without work for more than 3 days was to be branded with the letter V and sold as a slave for 2 years.
5	1553-58 – Reign of Mary I.
6	1558-1603 – Reign of Elizabeth I.
7	1597 – Act for the Relief of the Poor – included harsh punishments to act as a deterrent to vagrants.
8	1601 - Poor Laws aimed to make all local parishes provide poor relief for anybody who was not physically fit to work.
9	1603-25 – Reign of James I.
10	1605 – Gunpowder Plot.
11	1606 – Popish Recusants Act – forced Catholics to take an oath of allegiance to the English Crown.
12	1653-1658 – Rule of Oliver Cromwell as Lord Protector.
13	1671 - Game Act – poaching was illegal.
14	1688 – 50 capital crimes.

Key Concepts	
15	Religious changes in the C16th led to new and changing definitions of criminal activity.
16	Economic changes led to an increase in unemployment and vagrants and a suspicion of the poor by the upper classes.
17	Poaching and smuggling were seen to be ' social crimes '.
18	The population grew dramatically , from 2.5 million in 1500 to 5 or 6 million by 1700. Urban areas grew too.
19	Between 1500 and 1700, law enforcement was similar to how it had been in the Middle Ages . The community were still expected to take a leading role in stopping and finding suspects.
20	Growth of towns and rising crime rates meant that a new co-ordinated approach to enforcing law was needed .
21	Catholic persecution increased after the Gunpowder Plot of 1605.

Key Words		
22	Martin Luther	German monk who protested against the Catholic Church.
23	Reformation	The change from Catholicism to Protestantism.
24	Heretics	People who had a different religion to the monarch.
25	Treason	To challenge the authority of the monarch and their authority as Head of the Church of England.
26	Burned at the stake	Tied to a wooden post and a fire lit beneath the victim.
27	Middle Way	The attempt of Elizabeth I to create a Protestant Church that was not too challenging to Catholic traditions.
28	Act of Uniformity	Everyone had to go to church on Sundays and holy days or pay a fine.
29	Recant	Make a public statement that you have changed your religious beliefs.
30	Excommunicate	Eject from the Catholic Church.
31	Fox's Book of Martyrs	Published 1563, it describes the persecution of Protestants by Catholics under the reign of Bloody Mary (Mary I).
32	Vagabonds/Vagrants	Unemployed and homeless people who left their village or town in search of work.
33	Deserving Poor	Elderly and disabled.
34	Undeserving Poor	Those fit to work but did not.
35	Poor Relief	Financial assistance for the poorest members of society.
36	Enclosed	Fenced off for the exclusive use of the landowner.
37	Import Duties	Taxes payable on goods imported into the country.
38	Smuggling	Sneaking good into the country to avoid import duties.
39	Decriminalise	Make an activity legal, or no longer a crime.
40	Puritan	A radical Protestant.
41	Protectorate	The period that Oliver Cromwell was in charge.
42	Night watchman	Early form of policing. Worked for the town constable who was employed by the town authorities.
43	Thief takers	Paid a reward for catching a criminal and delivering them to the law.
44	Jonathan Wild	An infamous thief taker in London who secretly led a gang of thieves who claimed rewards when they handled stolen goods.
45	Bridewell Prison	Built in 1556 and used to punish poor people who had broken the law.
46	Capital Crime	A crime that is punished by the death penalty.
47	Pardon	When a person is let off punishment for a crime of which they have been convicted.
48	Bloody Code	Harsh attitude to law making. Many crimes were punishable by death.
49	Transportation	Being sent away from England to serve a period of punishment in a colony abroad.
50	Colonies	New settlements in foreign lands – often taken by force from the original inhabitants.
51	Plead for belly	Pregnant women condemned to death asked to be allowed to live until the baby was born.
52	Rehabilitation	Help someone return to normal life and society after they have committed a crime.
53	Conspirator	Someone who is involved in a conspiracy – a secret plan to do something illegal.
54	Pact	A formal agreement.
55	Demonologie	Book published in 1597 by James I about the nature of Hell and witches.
56	Superstition	Belief based on old ideas about magic rather than reason or science.
57	Matthew Hopkins	A self proclaimed Witchfinder General who hunted down witches in the East of England.
58	Familiars	Animals who worked for the devil and witches.
59	Swimming Test	Involved drowning the accused. The guilty would float and the innocent would sink.
60	Enlightenment	Philosophical movement of the C17th and C18th that focused on the use of reason to question and analyse ideas that were previously taken for granted.
61	Royal Society	Established in London in 1660 and brought together thinkers and scientists from a wide range of academic fields.

Box 1: Key Words

- Monotheistic:** A religion which believes in one God
- Holy:** Separate and set apart for a special purpose by God
- Omnipotent:** Almighty – unlimited power
- Benevolent:** all-loving
- Justice: what is right and fair
- Trinity:** God the father, Son and Holy Spirit
- Holy Spirit:** Gods presence in the world
- The Word:** Jesus – as described in the book of John
- Genesis:** The first book in the bible which has the creation story in it
- Incarnation:** God in human form – Jesus.
- Resurrection:** coming back from the dead
- Blasphemy:** saying or doing something which goes against God
- Crucifixion:** Roman method of execution where a person is nailed to a cross
- Ascension:** 40 days after the resurrection when Jesus returned to God in heaven
- Afterlife:** What happens when you die
- Day of Judgement:** God will judge all souls at the end of time
- Heaven:** Eternal happiness, being in the presence of God
- Hell:** Eternal suffering, absence of God
- Purgatory:** Catholic belief in which souls are cleansed in order to enter heaven
- Sin:** Any action against God
- Original Sin:** first sin in the world committed by Adam and Eve which means all humans are born with this in them
- Salvation:** saving the soul from sin and going to heaven thanks to Jesus' sacrifice
- Grace:** A quality of God which shows to humans that God loves them which they don't need to earn
- Forgiveness:** pardoning someone for their wrong doing
- Atonement:** restoring the relationship between people and God through the life, death and resurrection of Jesus
- Theodicy:** A religious explanation for the existence of evil and suffering

Box 2: God as omnipotent, loving and just

Christians believe **God is all-powerful**. He has unlimited power and can do anything.

"Nothing is impossible with God"

God is all-loving he loves humans so wants what is best for them. Guidelines are given for us to live the best lives we can. Christians should love each other treating everyone with care and respect. *"God so loved the world he gave his one and only Son..."* God has unlimited power and authority with complete love and therefore gives justice in a fair way. Christians should try and bring about fairness in the world.

Box 3: The Oneness of God and the Trinity

Christians believe that the Trinity is made up of God the father, the son and the holy spirit. They believe God is three in one. There are not three Gods, but different forms of the same thing.

Box: 4 Different Christian beliefs about Creation

Creation in Genesis 1:1-3 - God created the world in 6 days and rested on day 7. *"In the beginning God created the heavens and the earth"* God created the perfect world in the beginning. *"it was good"*

Creation in John 1:1-3 – *"In the beginning was the word....through him all things were made..."*. The word refers to Jesus and therefore he was present at the beginning of the world and involved in the creation of the world. This also shows the importance of the trinity being involved in the whole creation.

Box 5: The inconsistent Triad

Some people believe that you cannot have an all-loving God, who is all-powerful who allows evil and suffering to exist. Christians believe that God is transcendent (beyond our understanding) and therefore they can trust God when things in the world are not right. Christians have put forward a number of theodicies to attempt to address the inconsistent triad, such as life is a test and free-will.

Box 6: The Incarnation of Jesus – The Son of God

The Christmas story is the account of Jesus’ birth. Some believe that this story shows Jesus had an ordinary birth as someone who was fully human, however was fully God as it says in the bible he was born through the immaculate conception. *“before they came together, she was found to be pregnant through the Holy Spirit”*. This is proof to Christians that Jesus was incarnate. Through the incarnation God showed himself as a human. *“The word became flesh and made his dwelling among us”*. God in human form makes it easier for some to understand his actions, including miracles and resurrection. Jesus is known as the Messiah or special leader. When Jesus was baptised God said, *“You are my son”*. Jesus was asked whether he was the Son of God, he replied, *“I am”*

Box 7: The Crucifixion

It is believed that Jesus was arrested, tortured and then put to death by Pontius Pilate through crucifixion. As Jesus was fully human he suffered pain as an ordinary human did.

“Father, into your hands I command my spirit”
 Jesus forgave the guards who crucified him and one of the criminals who was crucified next to him, *“You will be in paradise with me this day”*. One of the Roman centurions said, *“Surely this is the Son of God”*.

The crucifixion influences Christians today by accepting Jesus sacrifice they can be forgiven for sin and go to heaven. They can acknowledge that suffering is a part of life and God can understand what it is like for someone to suffer.

Box 8: The Resurrection and ascension

Jesus was buried in a tomb and left there until Easter Sunday because it was the Sabbath no-one could touch the body until after this. When Mary Magdalene returned to the tomb it was open and empty. An angel appeared and said Jesus had risen from the dead.

The resurrection is one of the most important parts of Christianity as it proves Jesus was divine and not just a human. For the next few days and weeks Jesus appeared to several people including his disciples to tell them to spread the news that he had risen and that they should continue his message.

The ascension happened 40 days after the resurrection when Jesus went up to heaven. *“He left them and was taken up into heaven.”* He told his disciples to carry on his teachings, *“Go and make disciples of many nations, baptising them in the name of the father, Son and Holy Spirit”*.

The significance for Christians today is it shows the power of good over evil and that they can be resurrected and therefore shouldn't fear death. God will forgive sins and they can become closer to God. The holy spirit will be there to guide and comfort. The resurrection gives the point to the Christian faith.

Box 9: Sin and Salvation

Sin separates humans from God, this can be anything that goes against God or his laws. As humans are not perfect it is impossible not to sin. Christians believe that all are born with sin in them known as Original sin. This is due to Adam and Eve disobeying God and eating the fruit from the tree of knowledge. This action separated humans from God and brought about death into the world. They were tempted by the serpent (devil) and Christians believe that Christians are tempted in life to do bad things.

Christians have freewill however they should use this to make the right choices using God and Jesus' teachings to guide them, e.g. The Ten Commandments.

Salvation means to be saved from Sin and its consequences, e.g. going to hell. Sin separates us from God and salvation saves us from this. This salvation comes through faith in God and Grace through faith in Jesus.

Box:11 The afterlife and judgement

Christians believe there is another life. Christians believe that they have eternal life but what happens to them depends on their belief in God. Judgement will happen at death or at the day of judgment.

The Apostles creed says, *"...he will come to judge the living and the dead..."*

The parable of the sheep and Goats shows how people will be judged by God. The sheep are the good and the goats the bad, going to heaven and hell.

Jesus also said, *"I am the way the truth and the life, no-one comes to the Father except through me."* Treating others well and believing in God is important to guarantee a good afterlife.

Box 10: The role of Christ in Salvation

Salvation is offered through Jesus, *"For the wages of sin is death, but the gift of God is eternal life in Christ Jesus"*. Jesus' death makes up for original sin. Humans can receive forgiveness for their sins because of Jesus' death and then receive eternal life. His sacrifice provides atonement, which means our relationship with God is restored. This removes the effects of sin and allows humans to get back to God.

"He is the atoning sacrifice for our sins and for the sins of the whole world". Jesus paid the price for the sin of all mankind through his death and Christians believe if you put your trust in him you can receive eternal life with God. Salvation is a gift you must choose through belief in Jesus and following his teachings.

Box 12: Heaven and Hell

Based on judgement Christians believe that people will go to heaven or hell depending on how they behave and whether they have a belief in Jesus. Heaven is seen as being with God and eternal happiness where there is no suffering. Hell is seen as eternal torment or suffering and being absent from God and where the Devil is.

Some Christians believe that Heaven is a literal, real place you will go. Other Christians believe it is just being with God, in the same way hell may not be actually real but an absence of God. In the book of revelation it mentions people who go to hell will burn in a lake of fire.

Catholics believe in a place called purgatory in which your soul goes to be cleansed as no-one is ready yet to go to heaven as humans we are all imperfect.

Box 1: Key terms

1. **Multicultural Society:** a society that is made up of people from a range of cultural and religious backgrounds. National identity: an identity associated with being a citizen of a particular country.
2. **Identity:** characteristics/qualities that make a person who they are e.g. age, gender, religion, regional location, job etc.
3. **Multiple Identities:** an individual assumes a range of identities i.e. part of a family, the area they come from' linked to a school or a supporter of a football team etc. Britishness: the state of being British, or qualities that are considered typical of British people.
4. **National Identity:** identity associated with being a citizen of a specific country e.g.
5. English identity or Scottish identity. Discrimination: unfair treatment of others based on their race, gender, sexuality, age, disability, religion etc.
6. **Prejudice:** to pre-judge, have an unreasonable dislike for a person or group of people, view not based on experience. Stereotyping: a generalized view about a group of people linked to a personal characteristic e.g. hair colour, where they live, their way of life etc.
7. **Equality Act (2010):** law which legally protects people from discrimination in the workplace and in wider society.
8. **Immigration:** the act of someone moving into another country. Immigrant: a person who moves into another country to live, with the intention of staying there permanently.
9. **Migration:** the movement of people from one country to another – some moving in and others moving out.
10. **Net Migration:** the difference between the total number of people in and out of an area over a given period of time. If more people in the figure is a plus and if more people leave the figure is a minus. Community Cohesion: working towards a society where everyone shares a sense of belonging and common values – people live together peacefully and everyone feels valued.

Box 2: Identity



Box:3 Pattern of Migration to the UK

After World War II Britain needed people to come and fill job vacancies as many men had lost their lives in World War II. People from Republic of Ireland and from the former British Empire especially India, Bangladesh, Pakistan, the Caribbean, South Africa, Kenya and Hong Kong were given the opportunity to migrate to Britain.

By 1972, legislation meant that a British passport holder born overseas could only settle in Britain if they, firstly, had a work permit and, secondly, could prove that a parent or grandparent had been born in the UK. Freedom of movement and residence for persons in the EU was established by the Treaty of Maastricht in 1992.

Box 4: Key terms

1. **Justice:** A behaviour or treatment that is morally fair. Different countries can have different opinions about what justice is.
2. **Human Rights:** basic rights and freedoms all humans are entitled to. Since WWII these have been written into a large number of international charters. **Civil Liberties:** rights and freedoms that protect and individual citizen from the state. Civil liberties set limits on what a government can do so it cannot abuse its powers or interfere too much in the lives of private citizens.
3. **Duties (Responsibilities):** as well as being given rights as a citizen, states expect citizens to perform certain duties e.g. follow laws, in time of war a nation may recruit citizens into the armed forces.
4. **International Criminal Court:** set up in 1998 to try persons accused of 'crimes against humanity' or war crimes. 120 nations agreed to work with the court.
5. **European Arrest Warrant:** allows a police force in one country to ask a police force to arrest someone in another country.
6. **Barrister:** specialist in a narrow area of the law and are employed by solicitors on behalf of their clients to represent them in higher courts.
7. **Citizens Advice:** community based charity that gives help on advice – including legal advice.
8. **Civil Law:** law that deals with disputes between individuals or groups. There are civil courts which award damages (a money payment) or can make court orders which state that certain actions should be taken (a divorce for example).
9. **Criminal Law:** law that deals with individuals who break the law, as determined by the state. Police gather evidence and make arrests. The state prosecutes in a criminal court where juries decide whether an individual is innocent or guilty and judges decide on the sentence to be given.
10. **Solicitors:** legally qualified people who advise clients on a range of issues, such as divorce, buying a house, making a will, and criminal matters. They represent clients in lower courts, and prepare cases for barristers to try in higher courts. (Like going to your GP if you feel ill)

Human Rights Act (1998) - a UK law passed in 1998. It means that you can defend your rights in the UK courts and that public organisations (including the Government, the Police and local councils) must treat everyone equally, with fairness, dignity and respect.

3 main effects:

1. Incorporates the rights set out in the European Convention on Human Rights so if your human rights are breached you can take your case to a British court rather than having to go to the European Court of Human Rights (ECHR) in Strasbourg, France.
2. It requires all public bodies (courts, police, state schools, hospitals, local councils) to respect and protect your human rights.
3. Parliament will try and make sure new laws are compatible (matched) with the rights set out in the European Convention on Human Rights.

Box 6: European Convention on Human Rights (1950)

A treaty that was drafted in 1950. Each of the numbered "articles" protects a basic human right. They allow people to lead free and dignified lives. 47 states, including the UK, have signed up. That means that the UK commits to protecting the Convention rights. If a person's rights are being breached, and they can't get a solution in the UK under the Human Rights Act, the Convention lets them take their case to the European Court of Human Rights (ECHR).

Note: the ECHR is not part of the European Union (EU) – so even if we left the EU we would still be covered by ECHR decisions.

Box 7: Laws and Legislation
Common Law:
 Law based on judges rulings in court. Common law develops over time to deal with ever-changing situations in society. Judges create Common Law by giving a written judgment about the case before them.

Statute Law or Legislation:
 Law passed by Parliament. This law is written down in Acts of Parliament. For example, a Road Traffic Act might define speed limits and punishments given for

Box 8: The different roles within the hierarchy of the judiciary

Lord Chief Justice	The most senior judge in the UK: the head of an independent judiciary
President of the Supreme Court	Head of the UK's highest domestic appeal court
Justices of the Supreme Court	Judges who hear civil and criminal appeals in the UK's most senior court
Senior President of Tribunals	The head of the judges in the UK Tribunal Service
Master of the Rolls	President of the Court of Appeal (Civil Division)
Chancellor of the High Court	The head of the Chancery Division of the High Court
President of the Family Division	Head of Family Justice
President of the Queen's Bench Division	Also the Deputy Head of Criminal Justice
Lord Justices of Appeal	These judges hear appeal cases in the civil and criminal divisions of the Court of Appeal
High Court Judges	These judges may hear trial and appeal cases in the High Court, sit on some appeals in the Court of Appeal and judge serious cases in Crown Court trials
Circuit judges	These judges hear criminal cases in Crown Courts and civil cases in the County Courts
Recorders	These judges work part time hearing criminal cases in the Crown Court and civil cases in County Courts. These judges are qualified barristers or solicitors
District judge	These judges hear the bulk of civil cases in the county courts
District judge (Magistrates' Court)	These judges deal with the most complex cases in a Magistrates' Court
Tribunal judges	These judges deal with most cases brought before tribunal hearings; they often sit with lay members
Magistrates	Magistrates are volunteers from the local communities who agree to sit and dispense justice in Magistrates' Courts. They are also referred to as Justices of the Peace (JPs). They receive training and are supported by legal advice in the courtroom. They normally sit as a 'bench' of three magistrates. In 2014, there were 22,214 magistrates.

Issue	Civil Law	Criminal Law
Case brought by	Individual or group or organisation	CPS on behalf of the state
Decision	Defendant found liable in regard to the issue.	Defendant is convicted if found guilty or acquitted if found not guilty
Proof required	Evidence must be provided that supports the claim being made.	Beyond reasonable doubt
Burden of proof	The claimant must give the proof to support their claim.	The accused is innocent until proven guilty . The prosecution must prove their case; the accused does not have to prove their innocence.
Punishment	Damages, compensation or an injunction (an order to stop taking an action)	Non-custodial or custodial sentence if found guilty.
Appeal	Either party can appeal a court's decision.	Defendant may appeal against a court's verdict in regard to either the verdict or the sentence.

Components of Fitness (skill & health related)	
1. Balance	is the ability of the performer to retain their centre of mass over their base of support without falling Static – when still, Dynamic – whilst moving
2. Agility	is the ability to change direction with speed
3. Cardiovascular Endurance	The ability of the heart and circulatory system to meet the demands of the body for a long period of time
4. Coordination	is the ability to move two or more body parts at the same time
5. Flexibility	The range of movement at a joint
6. Muscular Endurance	The ability to use voluntary muscles, over long periods of time without getting tired
7. Power	The combination of speed or strength (Speed x Strength)
8. Speed	is the time taken over a set distance.
9. Reaction Time	The time between the presentation of a stimulus and movement
10. Strength	<p>Dynamic: This type of strength is used in events that take a long period of time to complete. i.e. Rowing action Maximal: The greatest force that is possible in a single maximum contraction</p> <p>Explosive: This type of strength comes about when a burst of maximum effort is required. e.g. Kicking a ball or striking a tennis ball during a groundstroke</p> <p>Static: Static strength takes place when the muscle length stays the same. It is used to stabilise the body. e.g. A rugby scrum</p>

Fitness Testing		
Name of Test	Component it tests	Protocol – how to carry out the test
11. Illinois	Agility	Performers start at the first cone. On the whistle pupils should follow the course in the diagram and finish at the end cone. Performers are timed from start to finish.
12. Stork	Balance	Athlete lifts the right leg, places the sole of the right foot against the side of the left kneecap. The athlete raises the heel of the left foot to stand on their toes. The athlete is timed holding this position for as long as possible.
13. Multistage fitness	Cardiovascular Endurance	20 metre distance to be marked out with cones. Athlete must arrive at the cone before the beep and wait. On the beep the athlete can resume running. The level and number of shuttles are recorded.
14. Wall Toss	Coordination	Athlete is to stand 2 metres from a wall. A tennis ball is thrown with their right hand against the wall and caught with the left hand. The ball is then thrown with the left hand and caught with the right hand. This cycle of throwing and catching is repeated for 30 seconds. The number of catches is recorded.
15. Sit & Reach	Flexibility	Legs straight with feet touching the box. Push marker as far as possible without bending your knees.
16. Sit Up Bleep	Muscular Endurance	Athlete performs sit ups in time with the bleep test signals to the point of exhaustion. The level of fitness reached depends on the level reached.
17. Vertical Jump	Power	Performers to reach up to highest point without going onto tiptoes. Jump vertically and touch highest point on the wall/board. The score is the difference between the 2 measurements
18. Ruler Drop	Reaction Time	A ruler is held by the assistant between the outstretched index finger and thumb of the athlete's dominant hand. Ensure the top of the thumb is level with the zero centimetre line on the ruler. Ruler is released and measurement (cm) is taken from the point caught on the ruler.
19. One Rep Max	Maximal Strength	Athlete should attempt to perform one full repetition of the stated exercise(e.g. leg press or bench press) at the highest possible weight. The weight should be recorded.
20. 30m sprint	Speed	Performers to cover a straight 30m from a standing start. The time taken should be accurately recorded.
21. Hand Grip	Strength	Start with your hand up and bring down to side while pulling in handle. Do not swing your hand.

TEACHERS TIP: You must be able to write the correct above definitions for each component of fitness and relate it to a sporting example. E.g. In football you need cardiovascular endurance to maintain your effort on the pitch for the full 90 minutes or you need good power in rugby in order to make a successful tackle.

Methods of Training	
1. Circuit Training	a series of exercises completed at stations one after another. It is a very good way of developing strength, muscular endurance and power.
2. Continuous Training	training involves a steady but regular pace at a moderate intensity which should last for at least 30 minutes. Activities can include running, walking, swimming, rowing or cycling.
3. Fartlek Training	It is a combination of different intensities. i.e. 1 lap at 50% max, 1 lap walking, 1 lap at 80%. Fartlek training is also referred to as 'SPEED PLAY'. To vary intensities you can adapt terrain, speed and gradients.
4. Interval Training	This training involves periods of work followed by periods of rest. <i>i.e. Sprint for 20 metre + walk to recover.</i> Lactic acid and oxygen debt builds up during interval, the rest phase allows for recovery of these levels.
5. Static Stretching	used to stretch muscles while the body is at rest. Each stretch should be held for 30 seconds and will increase flexibility.
6. Weight Training	training is a form of training that uses progressive resistance against a muscle group. Muscular strength: High weight x low repetition, Muscular endurance: Low weight x high repetitions
7. Plyometric Training	one method of strength training that can be used to improve power or muscular strength. Plyometrics exercises cause the muscle to lengthen (eccentric action) before a maximal muscle shortening (concentric action) <i>e.g. Bounding, hopping, jumping.</i>

Principles of Training	
S	8. Specificity – training geared to specific needs of sport and performer.
P O	9. Progressive overload – increasing difficulty of training so we make improvements (see below FITT)
R	10. Reversibility – if we are injured or do not train then we will lose fitness quicker than gained.
T	11. Tedium – in order to avoid boredom we must make training interesting.
Principles of Overload	
F	12. Frequency – the amount of times we train in a week – increase as we improve.
I	13. Intensity – how hard we train in sessions – increasing difficulty of exercise
T	14. Time – how long we train for – increase length of sessions as we improve.
T	15. Type – vary the exercise so we do not get bored.

16. Injury Prevention

- An effective warm up should be completed!
- What should be included in a warm up?
- Stretches should be overstretched or bounce during stretches.
- Appropriate footwear and clothing should be worn.
- Correct technique should be used when performing skills (e.g. weight training doing a squat with a bar)
- The training type should match the need of training purpose (e.g. continuous for aerobic, interval for anaerobic). You should train in the right training zone (e.g. 80-90% of MHR)
- Enough rest – important to not OVER train, recovery is important.
- Hydration should be maintained before, during and after training.
- Taping/bracing of joints/muscles should be done professionally if there are any ongoing injuries.

17. Warm Up

Should include the following:
 A gradual **pulse raising activity** (e.g. jogging, jumping, cycling – depends on equipment available and sport)
Stretching to prevent injury can be static or dynamic.
 A **skill based practices/familiarisation** (e.g. in football, passing in pairs, shooting, quick passing drill as a team)
Mental preparation to control arousal levels (time to focus, visualisation, deep breathing or a team chat with your coach to get focused on what needs to happen)

18. Cool Down

Should include the following:
 An activity that maintains **elevated breathing and heart rate**, eg a walk or slow jog
 A gradual reduction in **intensity** i.e. going from a jog to a slow walk before stopping completely.
Stretching of all the main muscles that were used in the sporting activity.

Skills and Techniques	
Stroke/Shot	Teaching Points
1. The forehand Push	Stand close to the table front ways on. Using a short stroke, hit the ball at the top of the bounce (at its highest point), strike the ball on the back bottom portion so that you use slight backspin
2. The Backhand Push	Stand close to the table, front ways on to the table, hit the ball at the top of the bounce, 50% of stroke action before hitting it, and 50% of stroke action after you have hit it (so its not too powerful)
3. The Forehand Drive	Stand close to the table, sideways on, facing the line of play. Using a medium stroke, racket arm should move slightly upwards in direction that the ball is going to travel. During the stroke your upper body should rotate 45 degrees to the right then turn back to face the ball, moving from right foot to your left.
4. The backhand Drive	Using a medium stroke your racket arm should move forward and upwards. Racket angle should be slightly closed, loose wrist to help with topspin. Hit the ball at the top of the bounce, using 50% of stroke action before hitting it, and 50% of stroke action after you have hit the ball.
5. The Serve	Table tennis serve is the most important stroke in the game because it provides the only situation in which you have total control over how and where you play the ball. <ul style="list-style-type: none"> - On your backhand side, position yourself at the side of the table, hold the racket at an open angle (like backhand push). - Balance the ball in the palm of your free hand and project the ball upwards, as near vertically as possible, so that it rises at least 6inches after leaving your hand. - Allow the ball to drop and then hit the ball with your racket – so that it bounces your side of the table then goes over the net and bounces on your opponent’s side.
6. The Forehand Smash	Body is in a sideways position, slightly away from the table. Backswing should bring your arm back directly behind the path of the ball and your body should be rotating back slightly as you transfer weight on back foot. Racket in a high position, so you can come downwards and forwards as you play your stroke and hit the ball. Strike the ball at the top of the bounce or at shoulder height. As you play the stroke you transfer weight forwards returning to ready position.
7. The Lob (backhand or forehand)	Ready position away from the table, right shoulder needs to rotate backwards and downwards until you racket is about knee height. Use a vertical brushing top spin action as you hit the ball. Aim to hit he ball at waist height. Follow through the stroke after hitting the ball until racket is at about head height.




Tactics and Strategies
<p>8. What shot do I play when? If the ball is played short (just over the net) return the ball with a defensive shot (the push). If the ball is played long (to the baseline on your side of the table) return the ball with an attacking shot such (the drive).</p>
<p>9. When should I use the forehand smash When the ball bounces higher than normal o your side of the table. The intention is to hit the ball as hard as possible, with minimal spin, in order to try and finish a rally and win a point.</p>
<p>10. Top Spin – is produced by starting your stroke below the ball and brushing your racket against the ball in an upward and forward motion. This increases the downward pressure on the ball, so after it bounces on the table it will stay low and accelerate forwards, causing it to rebound upwards off your opponents racket.</p>
<p>11. Back Spin – is produced by starting your stroke above the ball and brushing your racket against the ball in a downward and forward motion. This decreases the downward pressure on the ball, so after it bounces on table it rises up and not go as far forward. It will cause a rebound in a downward direction off opponents' racket.</p>
<p>1 2.Vary shots used - Try not to use the same shot every time you return the ball because then this becomes predictable to your opponent.</p>
<p>13 Vary the placement – Try to hit the ball into different spaces on the opponents side of the table so they have to move more – aiming for the backline, corners, sidelines and just over the net is the best place to aim.</p>
<p>14. What is the ready position? Neutral starting position, slightly bent arm, racket in front of you so you can just reach the end of the table, feet shoulder width apart and knees bent, racket in a neutral position so you can play either a backhand or forehand.</p>

Skills	Teaching Points
1. The Straddle Jump	<ul style="list-style-type: none"> As you take off, bring your legs apart and extend them out to the sides of you more than 90 degrees and horizontal. Straighten your arms, place them out to sides like legs, and place hands on knees/legs. Keep your upper body and head as still as possible. Ensure your toes are pointed and you are looking forwards.
2. The Tuck Jump	<ul style="list-style-type: none"> As you take off, bring your arms away from your sides and extend them out in front of you and elevate your arms quickly above your head. Keep your upper body and head as still as possible. As you begin to reach the peak of the jump, bring your knees upwards and into the chest. Ensure that both knees are tucked tight into the chest and the shins are vertical with the floor and parallel to your back. Bring the arms down from the extended position and touch the hands just below the front of the knees.
3. The Pike Jump	<ul style="list-style-type: none"> As you take off, keep your legs together and straight and extend them out in front of you. Knees should be straight and both knees and feet together touching. Straighten your arms, extend them out forwards and place hands on knees/legs. Keep your upper body and head as still as possible. Ensure your toes are pointed and you are looking forwards.
4 Seat Drop	<ul style="list-style-type: none"> As you take off, bring your arms away from your sides and extend them out in front of you and elevate your arms quickly above your head. Begin to tilt your pelvis upwards slightly to create a natural leg lift. Keep straight legs and do not purposely lift them up. Keep your upper body and head as still as possible. Maintain position. As you begin to lose height, bring your arms down to make contact with the bed just behind your bottom and extend your feet forwards. Ensure you land with your back close to upright and hands tucked in just behind your bottom with the fingers pointing forwards in the same way as your toes
5. Swivel Hips	<p>Seat drop as before – except your turn in the air (half twist) and complete another seat drop before returning to feet. Best way to learn is to break it up into the following progressions:</p> <ul style="list-style-type: none"> Seat drop to feet, half twist to feet, seat drop to feet. Seat drop into half twist to feet, seat drop to feet. Full swivelhips
6. Front Drop	<ul style="list-style-type: none"> As you take off, bring your arms away from your sides and extend them out in front of you and elevate your arms quickly above your head. Hold this upright position and begin to slightly push your hips backwards as you gain height. Keep your arms up and fingers in a position directly above your toes. Ensure extension of your arms and legs and allow the hip movement to provide the forward rotation. Do not look down and keep your eyes focused towards an end wall. Keep your upper body and head as still as possible. Maintain position. As you begin to lose height, bend your arms down to form a diamond shape with the hands overlapping slightly in front of the face. Your legs should be slightly bent at the knee and the body held in tension for a good landing. At impact, ensure that your hips are in a position to help you land in approximately the same place as your take-off position.

- Routine 1 Easy**
- Straddle
 - Full Twist
 - Tuck Jump
 - Seat Drop to feet
 - Half Twist
 - Seat Drop to Feet
 - Pike Jump
 - Straddle Jump

- Routine 2 - Moderate**
- Half Twist
 - Tuck Jump
 - Seat Drop into a Half Twist
 - Seat Drop to Feet
 - Straddle Jump
 - Full Twist
 - Seat Drop to Feet

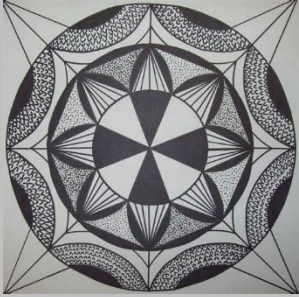
- Routine 3 - Difficult**
- Full Twist
 - Tuck Jump
 - Swivel Hips to Feet
 - Pike Jump
 - Full twist
 - Front Drop
 - Straddle Jump

BASIC RULES	BASIC TACTICS AND STRATEGIES
<p>1. What is the aim of wallball? Wallball is a simple activity played by hitting a ball against a wall with your hands. The aim of wallball is to score more points than your opponent by hitting a ball against a wall and landing inside the correct area on the floor.</p>	<p>8. The Target Serve Most professional players believe that a well-controlled serve is the most important shot in the game. Services that rebound and bounce low near the short lines makes it even more difficult for the retriever, specially if he/she does not know which the direction the serve is being aimed.</p> 
<p>2. When is a point won? A point is won by you if your opponent is unable to return the ball to the wall (e.g. they miss the ball, they hit the ball but it misses the wall, or the ball hits the floor before the wall).</p>	<p>9. What are the pass shots? The pass shot is just what the name implies, a shot that is hit past the opponent. Control the passing angles is very important in order to move the opponent out of the advantageous front court position. These shots are usually classified as “cross court” and “down the line” passes.</p>
<p>3. How is wallball scored? The winner of a game is the first to 11, 15 or 21 points or played a timed game (commonly 15/20 minutes). There must be a gap of at least two points between opponents at the end of the game though, so if the score is 10-10, the game goes in to extra play until one of the players has gained a lead of 2 points. The point goes to the player who successfully ends a rally, regardless of who has served. A match can consist of the number of games you like, just make sure you agree this in advance!</p>	<p>10. Important tactics to win games:</p> <ol style="list-style-type: none"> Always serve first if you win the toss at the beginning of the game Serve deep to push your opponent back Dominate the centre of the court Kill the ball, by hitting it low at the wall Hit the ball down the side of the court to move the players away from the centre Hit wide angles to push opponents off the court Hit to the player weaker hand In doubles drive the ball down the middle (hope to confuse the players so they both leave it) Hit to the weaker opponent in doubles  
<p>4. What is the ready position? Neutral starting position, feet shoulder width apart and knees bent, both arms in a neutral position so you can play either.</p>	
<p>5. What is the correct equipment needed to play wallball? It is recommended to use an official wallball when playing the sport, however, any ball that can be struck safely with the hand can be used e.g. tennis ball, soft play ball, etc. Wallball gloves are optional and usually the player will decide if needed or not. Goggles are required for official tournaments.</p>	
<p>6. Do we need a referee to play wallball? Wallball is a self-contained game and players are also expected to be referees, giving them experience of controlling a game, making decisions and taking ownership of their actions. It is recommended that the loser referees the next match.</p>	
<p>7. How do we start the game? The game will start by one of the players serving against the wall and the ball must return beyond the service line and inside the court.</p>	

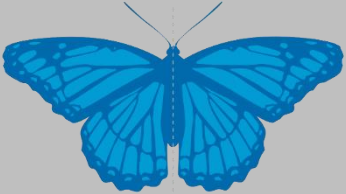
A. Key Terms

Keyword	Description
7. Pattern	A design that is created by repeating lines, shapes, tones or colours. The design used to create a pattern is often referred to as a motif. Motifs can be simple shapes or complex arrangements
2. Weight	The thickness of a mark or brushstroke
3. To Block in	to BLOCK IN: to fill in an empty area in an image with a certain colour before adding fine details such as shadows and highlights.
4. Composition	how objects or figures are arranged in the frame of an image
5. Contemporary	Living or occurring at the same time.
6. Negative Space	When drawing shapes, you must consider the size and position as well as the shape of the area around it. The shapes created in the spaces between shapes are referred to as negative space .
7. Geometric	characterized by or decorated with regular lines and shapes. "a geometric pattern"

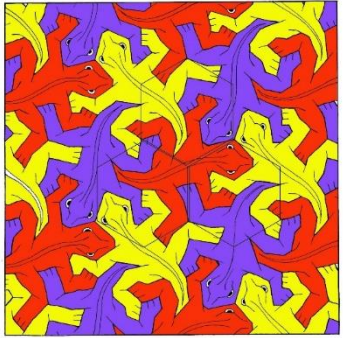
B. Pattern



B1: Radial Symmetry
A pattern that rotates around a central axis.



B2: Symmetry
the quality of being made up of exactly similar parts facing each other or around an axis.















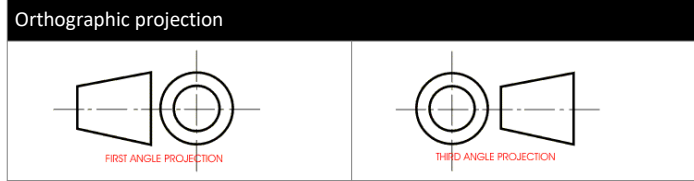
B3: Tessellation
A tessellation of a flat surface is the tiling of a plane using one or more geometric shapes, called tiles, with no overlaps and no gaps.

C. Painting techniques

Key Words: Painting Techniques and Equipment	
C1	Flat painting The use of flat colours (no tints or tones blended in) to give each shape a clear bold finish.
C2	Layers Additional layers of paint are added to make the painted shapes flatter in colour (no brush marks showing)
C3	Palette A flat container with wells to mix different coloured paint in.
C4	Paint brush A hand held painting tool to apply paint to any surface.
C5	Water pot A plastic container to hold water for cleaning brushes.











Materials	
Ceramic	Plastic
 <p>Glass— A hard, brittle substance, typically transparent or translucent, made by fusing sand with soda and lime and cooling rapidly.</p>	 <p>Acrylic (polymethyl methacrylate), (of synthetic resins and textile fibres) made from polymers of acrylic acid or acrylates.</p>
 <p>Concrete— A building material made from a mixture of broken stone or gravel, sand, cement, and water,</p>	 <p>High impact polystyrene (HIPS) (of plastic or a similar substance) able to withstand great impact without breaking.</p>
 <p>Terra cotta—Unglazed, typically brownish-red earthenware, used chiefly as an ornamental building material and in modelling.</p>	 <p>Polyvinyl chloride (PVC) A tough chemically resistant synthetic resin made by polymerizing vinyl chloride and used for a wide variety of products including pipes, flooring, and sheeting.</p>
Print	Wood
 <p>Aluminium—A metal used in domestic utensils, engineering parts, and aircraft construction</p>	 <p>Pine—An evergreen coniferous tree used for making furniture, doors and floors.</p>
 <p>Pewter—A gray alloy of tin with copper and antimony (formerly, tin and lead).</p>	 <p>Plywood—A type of strong thin wooden board consisting of two or more layers glued and pressed together</p>
 <p>Copper—A red-brown metal, a very good conductor of heat and electricity and is used especially for electrical wiring</p>	 <p>Medium density fibreboard (MDF) - A type of board made from compressed sawdust usually bonded with formaldehyde resin</p>



Title Block — Contents

Author	Drawing number	Date
Title	Materials	Scale
Sheet Number	System of measurement	Projection

Properties and characteristics of materials

 <p>Absorbency</p>	To be able to soak up liquid easily.
 <p>Strength</p>	The capacity of an object or substance to withstand great force or pressure.
 <p>Elasticity</p>	The ability of an object or material to resume its normal shape after being stretched or compressed; stretchiness.
 <p>Plasticity</p>	The quality of being easily shaped or moulded.
 <p>Malleability</p>	To be able to be hammered or pressed into shape without breaking or cracking.
 <p>Density</p>	The quantity of mass per unit volume of a substance
 <p>Effectiveness</p>	The degree to which something is successful in producing a desired result; success.
 <p>Durability</p>	The ability to withstand wear, pressure, or damage.

Environmental Factors

<p>Recyclability We should recycle as many materials as possible, as this reduces the amount of new materials required to manufacture the products we want.</p>	<p>Reusability Where possible, we should reuse products or their components / parts when they are disassembled, at the end of their life cycles.</p> <p>Products should be designed, so that they can be used again or at least their parts, with minimal reprocessing.</p>
<p>A vast range of materials can be recycled particularly paper, card, and many plastics.</p>	
<p>Sustainability This means using less non-renewable resources. Reducing the amount of raw materials we use to manufacture products.</p>	<p>Ecological footprint. The ecological footprint measures human demand on nature, i.e., the quantity of nature it takes to support people or an economy.</p>
<p>Reduce wastage of raw materials used in the manufacture of products.</p>	<p>The ecological footprint is defined as the biologically productive area needed to provide for everything people use:.</p>

SI Base Units

unit	abb	physical quantity	Smallest - - - - - Largest
metre	m	length	Micrometer, millimeter, centimeter, meter
second	s	time	Microsecond, millisecond, seconds
kilogram	kg	mass	Milligram, gram, kilogram
ampere	A	electric current	Micro amp, milliamp, amp, kiloamp
kelvin	K	thermodynamic temperature	Kelvin, degrees Celsius
candela	cd	luminous intensity	Microcandela, millicandela, candela
mole	mol	amount of substance	Nanomole, micromole, millimole, mole

Engineering Disciplines

Mechanical	Hydraulics, gears, pulleys
Electrical	Power station, household appliances, integrated circuits
Aerospace	Aircraft, space vehicles, missiles
Communications	Telephone, radio, fibre optic
Chemical	Pharmaceuticals, fossil fuels, food and drink
Civil	Bridges, roads, rail
Automotive	Cars, motorcycles, trains
Biomedical	Prosthetics, medical devices, radiotherapy
Software	Applications, systems, programming

Understand the making Process

1 Preparation	Drawing, CAD, sketches, plans.
2 Marking Out	Pencil, scribe, steel rule, tri square, marking gauge, calipers, centre punch.
3 Modification	Saw, jigsaw, scroll saw, laser cutter, pliers, hammer, drill, file, glass paper.
4 Joining	Riveting gun, spanner, screwdriver, hot glue, gun, soldering iron, nail gun.
5 Finishing	Hand sander, glass paper, disc sander, buffing wheel, polish, spray paint, varnish.

Health & Safety Legislation

Health and Safety at work Act	Personal Protective Equipment	Manual Handling Operations	Control of Substances Hazardous to Health	Reporting of Injuries RIDDOR
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You must be able to know the growth conditions for microorganisms and enzymes and the control of food spoilage. Know and understand that bacteria, yeasts and moulds are microorganisms. Explain that enzymes are biological catalysts usually made from proteins. Demonstrate the knowledge and understanding of the use of microorganisms in food production, including moulds in the production of blue cheese, yeast as a raising agent in bread. Know and understand the different sources of bacterial contamination. Know and understand the main types of bacteria that cause food poisoning. Demonstrate knowledge and understanding of the main sources and methods of control of different food poisoning bacteria types. Recognise the symptoms of food poisoning. Know and understand the food safety principles when buying and storing food. Know and understand temperature control and the danger zone temperatures.

Keywords

1. Bacteria
2. Microorganisms
3. Moulds
4. Enzymes
5. Temperature
6. Moisture
7. Time
8. Nutrients
9. pH level
10. Oxidation

Keywords

1. Starter culture
2. Probiotic
3. Pathogens
4. Food Poisoning
5. Contamination
6. Salmonella
7. Staphylococcus Aureus
8. Clostridium Perfringens
9. Clostridium Botulinum
10. Bacillus Cereus
11. Food Borne disease
12. E Coli
13. Listeria
14. Campylobacter
15. Norovirus

Keywords

1. Use by date
2. Best before date
3. Frozen Food
4. Chilled Food
5. High risk foods
6. Low risk foods
7. Danger zone
8. Hygiene

Quick Test

1. What are microorganisms?
2. What is the ideal temperature for bacterial growth?
3. What is the most important bacteria used in food manufacturing?
4. What are the two date marks you need to check when buying food?
5. What is the recommended temperature for chilled food?
6. What is the temperature range of the danger zone?
7. Explain the term cross contamination.
8. List four occasions during food preparation when you must wash your hands.

Key Points

1. Bacteria are found everywhere and need the right temperature, warmth, time, nutrients, pH level and oxygen to grow and multiply.
2. Microorganisms (bacteria) are used to make a wide range of food products.
3. Bacteria are used to make cheese, yogurt and bread.
4. The most important bacteria in food manufacturing are Lactobacillus species.
5. Bacterial contamination is the presence of harmful bacteria in our food, which can lead to food poisoning and illness.
6. As a food handler you must do everything possible to prevent this contamination.
7. What are the main symptoms of food poisoning?
8. Name three bacteria responsible for food poisoning?
9. Which groups of people are more at risk of food poisoning?
10. When handling food at any stage care must be taken to prevent contamination.
11. Everything possible must be done to control the conditions that allow bacteria to multiply causing food poisoning.

Key words

1. Bridge hold
2. Claw grip
3. Jardinière
4. Julienne
5. Macedoine
6. Chiffonade
7. Battonnet
8. Dicing
9. Chopping
10. Paring
11. Flexible
12. Filleting
13. Serrated
14. Cooking

Keywords

1. Ingredients
2. Precise
3. Combined
4. Rubbing-in
5. Binding
6. Coating
7. Enriched dough
8. Glazing

Keywords

1. Physical raising agents
2. Chemical raising agents
3. Yeast
4. Bicarbonate of soda
5. Baking Powder
6. Fermentation
7. Carbon Dioxide

Keywords

1. Gliadin
2. Glutenin
3. Gluten
4. Carbon Dioxide
5. Shortcrust
6. Choux

Keywords

1. Shortening
2. Plasticity
3. Aeration
4. Creaming
5. Foam
6. Emulsification.

Keywords

1. Senses
2. Taste
3. Aroma
4. Texture
5. Olfactory
6. Sensory analysis
7. Palate
8. Sensory characteristics
9. Rating Tests
10. Ranking tests
11. Star profile
12. Triangle testing
13. Paired preference tests

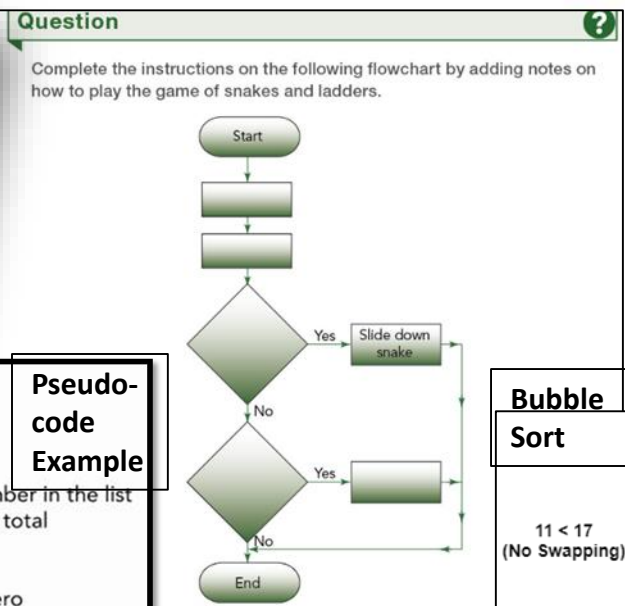
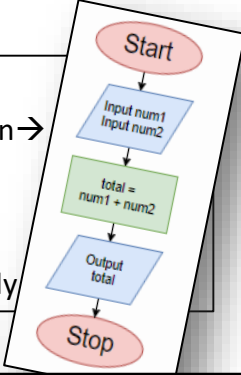
Quick test

1. Name two methods of holding food when cutting it
2. What glaze would you use on enriched dough?
3. What type of flour is used to make bread dough
4. What gas does yeast produce?
5. Why is it important to use codes when tasting food
6. List the stages used to carry out a controlled sensory analysis
7. What is triangular testing?
8. What term describes how fat makes a short texture product?
9. Which basic cake making process traps air into the cake? How does egg white trap air?

Key points

1. Specific types of knives are designed for specific cutting and shaping tasks.
2. Knives are dangerous and if not handled correctly and care should be taken at all times.
3. A flat and stable cutting surface is essential to avoid injury when cutting food
4. There are specific terms used for vegetable cuts relating to the size and shape of the outcome

- ### Algorithms
- Sequence, Selection, Iteration →
 - Flowcharts
 - Interpreting
 - Creating your own
 - Using symbols correctly



- ### Searching & Sorting
- Searches
 - Binary
 - Linear
 - Sorts
 - Bubble →
 - Merge
 - Pros and Cons

- ### Pseudo-code
- Written Description of instructions
 - Write an Algorithm
 - Complete an unfinished Algorithm

Pseudo-code Example

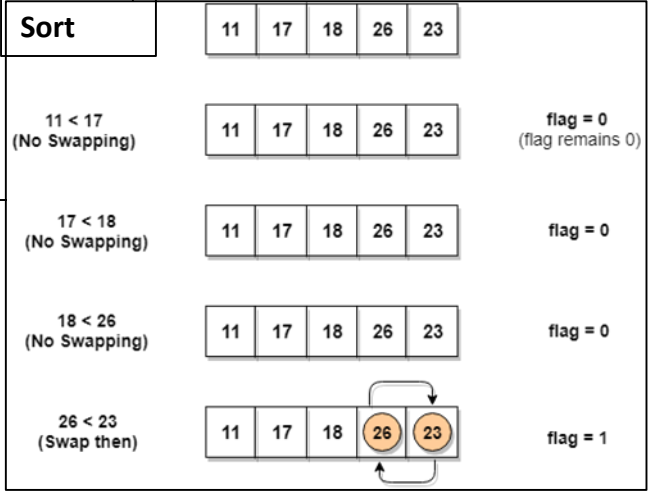
```

set total to zero
get list of numbers

loop through each number in the list
  add each number to total
end loop

if number more than zero
  print "it's positive" message
else
  print "it's zero or less" message
end if
    
```

Bubble Sort



- ### Interpreting Algorithms
- Purpose of a given algorithm
 - Explain how it works
 - Determine output for given inputs
 - Write a Trace Table
 - Identify Logic Errors
 - Discuss efficiency

Programming tutorial or snippets
https://www.tutorialspoint.com/python/python_lists.htm
Example Output code below:

```

# The capitalisation method

fn="trevor"
sn="brooking"

#A name should be capitalized

a=fn.capitalize();
b=sn.capitalize();

print a
print b
    
```

```

>>> print "hello world"
hello world
>>> print 'I am a python programmer'
I am a python programmer
>>>
    
```

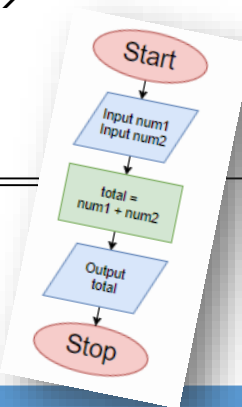
Revise Bubble and Merge Sort Explained
<https://www.youtube.com/watch?v=EM3YC3dtMv8>

<https://medium.com/yay-its-erica/algorithms-for-beginners-bubble-sort-insertion-sort-merge-sort-29bd5506cc48>
 (USE THIS LINK TO FIND OUT ABOUT SORTING TECHNIQUES)

https://www.youtube.com/watch?v=e_WfC8HwVB8

Algorithms

- Sequence, Selection, Iteration →
- Flowcharts
 - Interpreting
 - Creating your own
 - Using symbols correctly



Evaluating Algorithms

- Importance of data structure
- Fitness for purpose
- Efficiency (Big "O" Notation)

<https://www.programiz.com/python-programming/examples>

Interpreting Algorithms

- Purpose of a given algorithm
- Explain how it works
- Determine output for given inputs
- Write a Trace Table
- Identify Logic Errors
- Discuss efficiency

```

for passes in range(count-1):
    for num in range(count-1):
        if a[num+1] < a[num]:
            temp = a[num]
            a[num] = a[num + 1]
            a[num+1] = temp
    
```

Pseudo-code

- Written Description
- Write an Algorithm
- Complete an unfinished Algorithm
- Code in a HLL (e.g. Python)

Designing Solutions

- Analyse a Problem
- Decompose it
- Abstract the Data Structure
- Identify inputs, process, outputs
- Design an Algorithm

SET <var> TO <expression> SEND <expression> TO DISPLAY RECEIVE <var> FROM (<type>) KEYBOARD	FOR <counter> FROM <a> TO code that repeats END FOR
IF <expression> THEN code to run if true ELSE code to run if false END IF	WHILE <condition> DO code that repeats END WHILE or REPEAT code UNTIL ...

```

a="Alan "
b="Devonshire"

c=a+b

print c
    
```

Example string

```

count = 0
while (count < 9):
    print 'The count is:', count
    count = count + 1

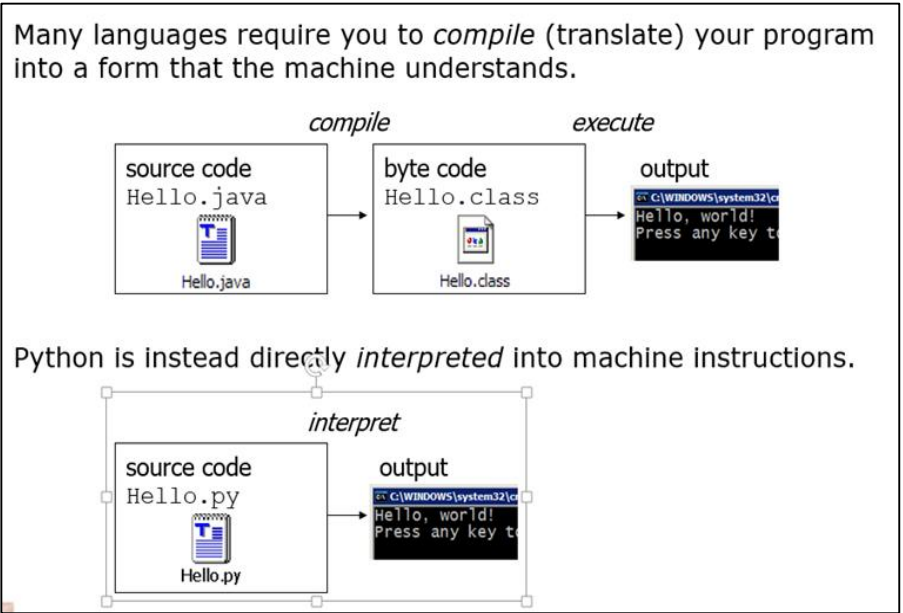
print "Good bye!"
    
```

```


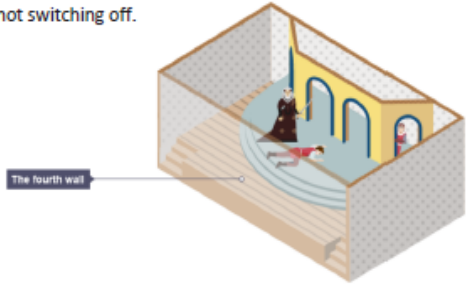
a=raw_input("enter the first number")
b=raw_input("enter the last number")
c=a+b

print c
    
```

Example loop



Devised: Explanation	Devised: How Assessed
<p>Devising is a way of creating a drama without starting with a script. It usually begins with an idea and a stimulus. Actors and designers research, improvise, develop and shape scenes until they have a drama ready for an audience. The play you create will use either the techniques from a theatre practitioner (e.g. Brecht or Stanislavski) or in the style of a theatre genre (e.g. Physical Theatre or Theatre in Education). You will research your chosen topic, create a performance and document the development in a devising log portfolio. You will then write an evaluation of the final performance. This knowledge organiser will focus on Brecht.</p> <p>Higher Level Challenge In order to gain the most marks in your performance exam and your portfolio remember to consider and refer to the following contexts:</p> <ul style="list-style-type: none"> ▪ Social Context: A social setting or environment which people live. ▪ Historical Context: A part of history which has happened (this could be when the play was set) ▪ Political Context: The political party in power at the time and how this impacted on society. ▪ Cultural Context: How culture can effect behaviour, choices and decisions for characters. 	<p>Performance A performance live on stage which is designed to realise your original intentions.</p> <p>Devising Log : Portfolio A record of the creation and development of your ideas to communicate meaning through and the development of your play.</p> <p>Devising Log: Evaluation An analysis and evaluation of your individual contribution to the devising process and the final devised piece.</p>

Bertolt Brecht – A Brief Background	Why is Brecht so important?	The ‘V’ effect
 <p>The playwright Bertolt Brecht was born in 1898 in the German town of Augsburg. After serving as a medical orderly in the First World War and appalled by the effects of the war, he went first to Munich and then to Berlin in pursuit of a career in the theatre. That period of his life came to an end in 1933 when the Nazis came to power in Germany. Brecht fled and during this period the Nazis formally removed his citizenship, so he was a stateless citizen.</p> <p>In 1941 Brecht became resident in the USA but returned to Europe in 1947 after appearing before the House Un-American Activities Committee. Ostensibly against communism, this committee also targeted intellectuals. By the time of his death in 1956, Brecht had established the Berliner Ensemble and was regarded as one of the greatest theatrical practitioners.</p> <p>As an artist, Brecht was influenced by a diverse range of writers and practitioners including Chinese theatre and Karl Marx. The turmoil of the times through which Brecht lived gave him a strong political voice. The opposition he faced is testament to the fact that he had the courage to express his personal voice in the world of the theatre. He also had an original and inspired talent to bring out a dynamic theatrical style to express his views.</p> <p>His most acclaimed work is <i>Mother Courage and Her Children</i>. Although it’s set in the 1600s, the play is relevant to contemporary society and is often regarded as one of the finest anti-war plays. <i>Fear and Misery of the Third Reich</i> is Brecht’s most overtly anti-fascist play. This work analyses the insidious way the Nazis came to power.</p>	<p>Bertolt Brecht was a theatre practitioner. He made and shaped theatre in a way that had a huge impact upon its development. Many of his ideas were so revolutionary that they changed the theatrical landscape forever. Modern theatre owes a lot to his methods.</p> <p>When naturalistic theatre was at its height and acted as a mirror to what was happening in society, he decided to use it as a force for change. He wanted to make his audience think and famously said that theatre audiences at that time “hang up their brains with their hats in the cloakroom”.</p> <p>In naturalistic or dramatic theatre the audience care about the lives of the characters onstage. They forget their own lives for a while and escape into the lives of others. When an audience cries for a character or feels emotion through the events happening to them it’s called catharsis.</p> <p>Brecht was against cathartic theatre. He believed that while the audience believed in the action onstage and became emotionally involved they lost the ability to think and to judge. He wanted his audiences to remain objective and distant from emotional involvement so that they could make considered and rational judgements about any social comment or issues in his work. To do this he used a range of theatrical devices or techniques so that the audience were reminded throughout that they were watching theatre; a presentation of life, not real life itself. His kind of theatre was called Epic theatre. He called the act of distancing the audience from emotional involvement the verfremdungseffekt.</p>	<p>Many people speak of alienating the audience (making them separate from the action) but verfremdungseffekt actually translates more closely to ‘distancing.’ However, it’s still often called the alienation effect or is shortened to the ‘v’ effect and there are many ways of using it.</p> <p>Brecht definitely wanted his audience to remain interested and engaged by the drama otherwise his message would be lost. It was emotional investment in the characters he aimed to avoid.</p> <p>His approach to theatre suits work which has a political, social or moral message. Perhaps you want the audience to consider the meaning in a parable (a story with a wider moral message). You might want to explore a theme or issue and make your audience consider varying viewpoints or sides to an argument. If so you can learn a lot from the distancing devices used in Brechtian theatre.</p> <p>Epic theatre (Brechtian theatre) breaks the fourth wall, the imaginary wall between the actors and audience which keeps them as observers. They are active members of the theatrical experience as they are kept thinking throughout, not switching off.</p> 

Brechtian devices to create the 'v' effect

A theatrical **device** is a method or technique used onstage which has an aim or purpose. The aim when using the 'v' effect is to ensure that the audience are constantly reminded that they're watching a piece of theatre. Brecht used the techniques below to alienate the audience causing the 'v' effect.

Political Message

Brechtian plays have a political message.

Narration

Narration is used to remind the audience that what they're watching is a presentation of a story. Sometimes the narrator will tell us what happens in the story before it has happened. This is a good way of making sure that we don't become emotionally involved in the action to come as we already know the outcome. There are two types of narration:

1. **In role**
The character narrates in first person For example "My name is Little Red Riding Hood. I live in the forest".
2. **Third Person/Out of role/All Knowing**
Commenting upon a character as an actor is a clear way of reminding the audience of theatricality. The narrator speaks in third person. For example "This is Little Red Riding Hood.. She lives in the forest".

Speaking the Stage Directions

This device was used by Brecht more frequently in rehearsal than performance. It helps distance the actor from the character they're playing. It also reminds the audience that they're watching a play and forces them to study the actions of a character in objective detail.

Direct Address and Step Out

Speaking directly to the audience breaks the fourth wall and destroys any illusion of reality. An example would be the moment where Grusha pleads to save baby Michael in *The Caucasian Chalk Circle* by Brecht: I brought him up, shall I also tear him to bits? I can't.

Placards

A placard is a sign presented onstage. Using placards might be as simple as holding up a card or banner. Multimedia or a PowerPoint slideshow can also be used for this effect. The musical, *Miss Saigon*, for example, used a slideshow to demonstrate the loss of lives in the Vietnam War which was highly effective. What's important is that the information doesn't just comment upon the action but deepens our understanding of it. For example, a married couple are arguing and the wife is very upset. If the actress held up a placard saying 'I'm miserable' that wouldn't tell us anything about the character that we didn't already know. However, if her placard said 'I'm having an affair' or 'I've never loved him' the audience would be forced to consider other aspects of their relationship and to think about deeper reasons behind her tears. Placards can also help the audience to consider wider contexts, for example, the wife could hold up a placard that says facts about divorce "50% of married couples apply for divorce" Placards can also be used to identify changes the movement from one episode to the next.

Symbolic Props

Often one item can be used in a variety of ways. A suitcase might become a desk, or a car door or a bomb.

Episodes

Brecht called scenes 'episodes', with each scene being relatively self-contained.

Minimal set / costume / props

Set, costume and props are all kept simple and representational. Elaborate costumes might mean that the sense of theatre, of pretending to be something else, was lost.

Shock Tactics

Brecht would often try to shock the audience so that they would really consider his political message.

Multi-roling

Multi-roling is when an actor plays more than one character onstage. The differences in character are marked by changing voice, movement, gesture and body language but the audience can clearly see that the same actor has taken on more than one role. This means the audience are more aware of the fact that they are watching a presentation of events. Cross-sex casting is also possible in Epic theatre as we don't need to suspend our disbelief.

Split-role

This is where more than one actor plays the same character. For instance, the actor playing the main character might rotate from scene to scene. This keeps that character representational and inhibits emotional involvement and attachment on the part of the audience.

Stylised Lighting

Brecht believed in keeping lighting simple as he didn't want the production values to overshadow the message of the work. He believed in using harsh white light as this illuminates the truth. However, many modern productions do use lighting effects. The important thing is that the audience still see the theatre, so often they will see production personnel, such as backstage crew, in action on the stage rather than hidden.

Spass

Spass literally translates as 'fun'. Brecht wanted to make his audience think. He realised that while we are laughing we are also thinking. Brechtian work isn't boring and it's definitely not always serious either. Even if the message itself is serious Brecht realised that comedy could be an excellent way of engaging the audience and forcing them to think about issues. Spass was also used to break the tension. For example, a very serious work addressing suicide might break the action by creating a parody of an American advert: Are you feeling low? Depressed? Think there's no way out? Then you need new 'End it All'...The poor taste of this would be shocking for an audience. But it actually highlights the pain of depression through contrast and black comedy. The audience will laugh and then question why they laughed.

Gestus

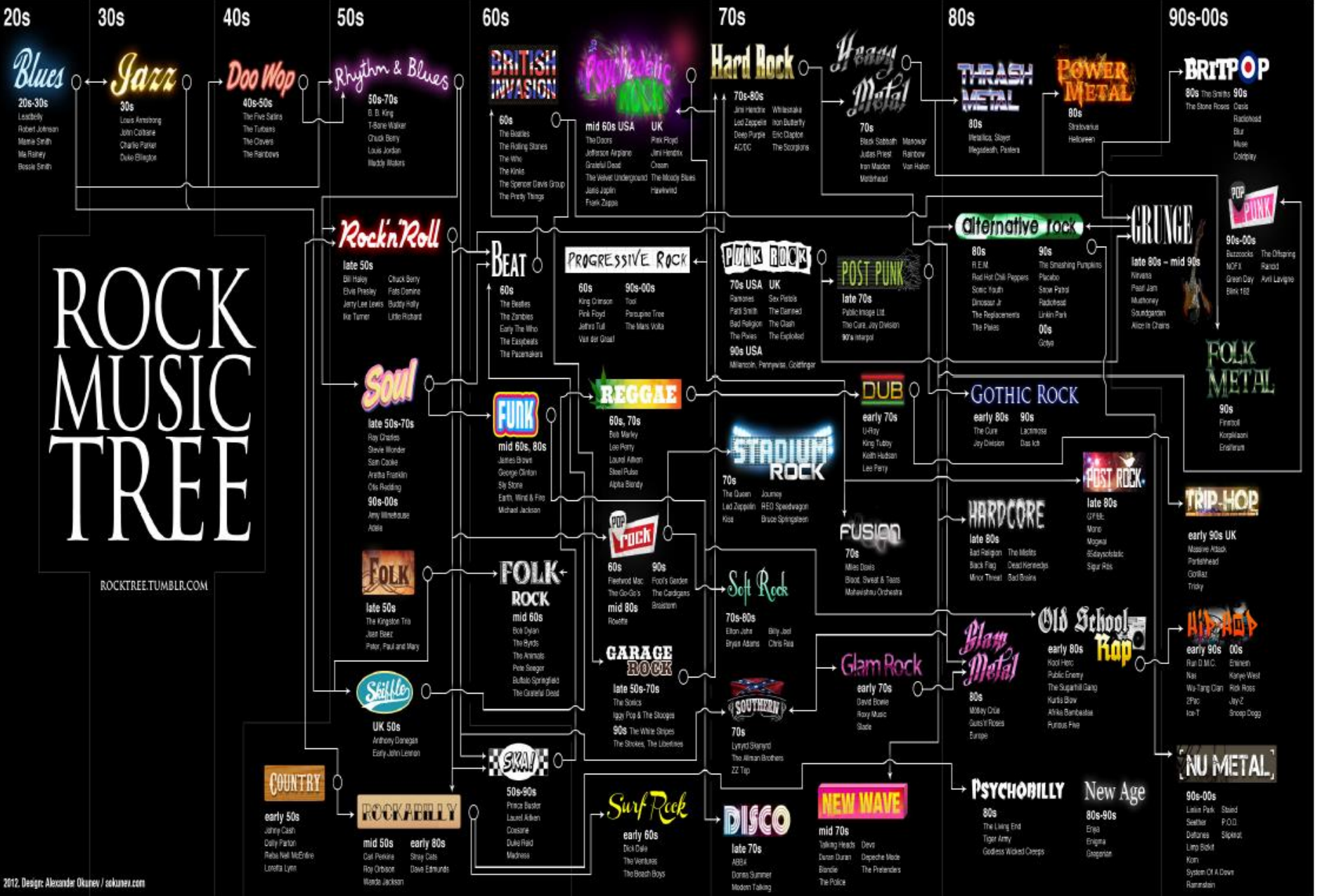
Gestus, another Brechtian technique, is a clear character gesture or movement used by the actor that captures a moment or attitude rather than delving into emotion. So every gesture was important and exaggerated. Brecht didn't want the actors to be the character onstage, only to show them as a type of person. For example, the boss who is corrupt and smoking a fat cigar as his workers starve is representative of every boss who profits through the exploitation of others. For this reason Brecht will often refer to his characters by archetypal names, such as 'The Soldier' or 'The Girl'. So we judge the character and their situation, rather than just empathising with them. Gestus is also gesture with social comment. For example, a soldier saluting as he marches across a stage is a gesture. But if he was saluting as he marched over a stage strewn with dead bodies, it would be Gestus as a social comment about the type of person he represents.

Song, Nursery Rhyme, Dance and Movement

This reminds the audience of the fact they are watching a play. Often in Brechtian theatre the style of the music and the lyrics jar, they don't seem to fit together in style. This distances the audience further. Brecht used melodies that are upbeat and joyous, yet the lyrics are sinister and dark (example 'Mack the Knife' from *The Threepenny Opera*). Brecht also used well known nursery rhymes and changed the lyrics to deepen the audience's thoughts and have an impact on how they felt about certain political views.

Ensemble

All members of the cast working together on behalf of the play, rather than emphasising individual actors or characters.



1950s – Rock 'n' Roll	Late 1960s - Rock	1970s – Rock's Diversification
<p>Artists: Elvis Presley; Bill Haley & The Comets; Buddy Holly</p> <p>Musical features: 12-bar Blues; walking bassline; guitar-driven; fast pace; swung rhythms.</p> <p>R&B/Blues combined with Country Music appealing to the newly-developed 'teenage' audience.</p>	<p>Artists: Rolling Stones; Jimi Hendrix; The Who</p> <p>Musical features: slide guitar, harmonica, solos for guitar and drums, barre chords, distortion.</p> <p>Rock that was heavily influenced by black R&B/Blues music set the scene for many heavy metal bands in the futures.</p>	<p>Heavy Rock – Progressive Rock – Latin Rock – Glam Rock – Soft Rock – Country Rock – Punk Rock – New Wave</p> <p>Artists: Led Zeppelin; Deep Purple; Pink Floyd; T-Rex; Queen; Sex Pistols</p> <p>Musical features: effects added; world influences; electric guitar; wailing vocals; modal; intricate melodies/solos; theatrical.</p>
<p>Early 1960s – Beat Music</p> <p>Artists: The Beatles; Rolling Stones; Bob Dylan;</p> <p>Musical features: Strong rhythms of un-swung quavers; catchy tunes; guitar-dominated; close harmonies.</p> <p>British Beat Music/Mersey Beat combined rock 'n' roll, R&B and soul, appealing to the rock 'n' roll teenagers and developing into a British dominance of the charts.</p>	<p>Music then went in 2 opposing directions – optimistic utopian hippy-influenced or disillusioned cynicism full of life & destruction.</p>	<p>Music became increasingly diverse, with bands building on experiments of the 60s into long studio-conceived albums, whereas the introduction of stadium rock concerts focused songs into live versions.</p>

1980s – Heavy Metal	1990s – Grunge/Alternative/Britpop	2000s – Indie/Alternative
<p>Artists: Motorhead; Iron Maiden; Guns 'n' Roses; The Smiths</p> <p>Musical features: fast tempi; driven by powerful bass lines & large drum kits; power chords; extended solos; minor modes; mythological themes.</p> <p>As political moods settled, so music calmed, reflecting this change in direction, becoming more focused on image and commercial acceptance.</p> <p>A combination of psychedelic & blues rock, starting from Punk, but getting progressively darker.</p>	<p>Artists: Nirvana; Red Hot Chilli Peppers; Oasis; Blur, Radiohead</p> <p>Musical features: Fast tempos; scruffy sound & visuals; guitar-based; non-conventional harmonies; easy chords; nasal vocals.</p> <p>Back-to-basics post punk reaction to the commercialization of music spawned the grunge movement in the USA.</p> <p>In the UK grew a cleaner, less distorted version from the working class viewpoint with an amateur musician feel.</p> <p>This later developed into the more progressive alternative rock.</p>	<p>Artists: Arctic Monkeys; Kaiser Chiefs; The Killers; Coldplay</p> <p>Musical features: Medium tempo; high bass melodic phrases; short melodic licks; sing along choruses; orchestral influences.</p> <p>Technology and the internet meant that styles popped up and fused overnight and artists could be heard and known far quicker, before even playing a gig.</p>

KEYWORDS

<p>1-12-bar blues - A chord structure of 12-bars using chords I, IV and V.</p>	<p>7-Distortion– altering the tone of electric instruments to make them sound gritty, growly or fuzzy.</p>
<p>2-Walking bassline – a bassline that moves by step.</p>	<p>8-Modal – system of scales from medieval period, pre major/minor system.</p>
<p>3-Swung rhythm – a rhythm that emphasizes the first pair of quavers.</p>	<p>9-Power chords – a chord using just the 1st & 5th notes (omitting the 3rd).</p>
<p>4-Close harmonies – harmony where notes of the chords are close together, typically in vocal music.</p>	<p>10-Riff – short repeated phrase in popular music.</p>
<p>5-Slide guitar – a sliding effect across the strings of a guitar, often used in blues.</p>	<p>11-Lick – stock pattern or phrase, usually played on the guitar, similar to a riff.</p>
<p>6-Barre chords – a type of chord on a guitar played by using one or more fingers to press down multiple strings across a single fret of the fingerboard.</p>	<p>12-Chord – 2 or more notes played simultaneously.</p>



MR TIGHTS	Features	KEYWORDS
Melody	<ul style="list-style-type: none"> • Syllabic – throughout, mainly. • Vocalisation - backing vocals mix words and vocalisation (e.g. bars 8–9) to the sound 'oooh' and bar 18 to the sound 'ba'. • Conjunct - starts mostly stepwise with small leaps of a third or fourth. • Sequence – descending & slightly altered in bars 7 and 8. • Angular leaps - combine conjunct and wide leaps in the melodic line. B.6-7: Leap of rising major sixth; b.62 – an octave. 	1- Syllabic - when one note is sung per syllable.
		2- Vocalisation - wordless singing using a vowel syllable such as 'ah'.
		3- Sequence - the repetition of a musical phrase at a higher or lower pitch than the original.
		4- Conjunct - movement by step.
		5- Moderato – tempo marking, at a moderate pace.
		6- Swung - music that has a triplet feel, even when notated with straight quavers.
		7- Anacrusis - one or more unstressed notes before the first bar line of a piece or passage.
		8- Compound time signature - when the bar feels like it needs to be split into groups of three (having a group of three 'mini' beats in a 'big' beat).
		9- Triplets - a horizontal square bracket that lets the performer know that the three notes should be played in the time it normally takes to play two.
		10- Homophonic - a texture comprising a melody part and an accompaniment.
Rhythm (incl. tempo & metre)	<ul style="list-style-type: none"> • Moderato tempo - with a dotted crotchet pulse of 112 beats per minute. • 12/8 - compound quadruple time signature; occasional 6/8 bar - has the effect of extending the phrase length. • Swung feel. • Anacrusis (upbeat) – starts every verse and chorus. • Syncopation - frequent throughout (e.g. bars 44–46). • Triplets - bar 18. 	11- Imitation - the repetition of a phrase or melody in another part or voice, usually at a different pitch.
		12- Panning - giving sounds different levels in the left and right speakers so that it sounds as if they are coming from a new direction.
		13- Antiphonal - music performed alternately by two groups, which are often physically separated.
		14- Overdubbing - recording an instrumental or vocal part over previously recorded music.
		15- Pull-off - when a note is sounded on the guitar by plucking the string with the fretting hand.
		16- Bend - push a string across or over the fingerboard with your left hand fingers so that the string gets tighter and the pitch goes up.
		17- Vibrato - a technique used to cause rapid variations in pitch. The term 'vibrato' is Italian and is the past participle of the verb 'vibrare', which means to vibrate.
		18- Multi-track - a recording of a performance (or performances) on separate tracks in which each track can be edited individually to change levels, add effects, etc.
		19- EQ - the levels of frequency response of an audio signal, or controls, which allow their adjustment.
		20- Flanger - an effect creating a swirling or swooshing sound.
Texture	<ul style="list-style-type: none"> • Homophonic – predominant texture. • Imitation. • Layering - Three-part texture during guitar solo. • Panning - (e.g. bars 42-43 backing vocals). • Antiphonal - (e.g. bars 67-68). 	21- Distortion - an effect that increases the volume and sustain on an electric guitar as well as making the timbre more gritty or smooth depending on the settings.
		22- Reverb - an effect, which creates the impression of being in a physical space.
		23- Wah-wah - a filter effect in which the peak of the filter is swept up and down the frequency range in response to the player's foot movement on a rocker pedal.
		24- Circle of fifths - a series of chords in which the root note of each chord is a fifth lower or a fourth higher than that of the previous one.
		25- Extended Chord - a chord with at least one added note, such as the ninth.
		26- Perfect cadence - a cadence comprising two chords. A perfect cadence is chord V followed by chord I.
		27- Inversions - major or minor triads with either the third (first inversion) or the fifth (second inversion) in the bass.
		28- Altered Chord - notes in a chord that have been sharpened or flattened by a semitone, such as a flattened fifth.
		29- Pedal - a sustained or repeated note in the bass. Pedals are usually on the tonic or dominant notes, so would be called either a tonic or a dominant pedal.
		30- Verse-chorus form : Intro-Verse 1-Chorus 1-Instrumental-Verse 2-Chorus 2-Guitar solo-Verse 3-Chorus 3-Outro.
Instrument (sonority)	<ul style="list-style-type: none"> • Tenor – high male voice, performed by Freddie Mercury. • Instruments - lead and backing vocals, piano, overdubbed with a honky-tonk (jangle) piano, four electric guitars, bass guitar and drum kit. • Overdubbing - Guitars and vocals, creating a richer colour. • Guitar techniques - slides, bends, pull-offs and vibrato. • Recording techniques & effects - multi-tracking, EQ, flanger, distortion, reverb, wah-wah, panning and overdubbing. 	
Genre	<ul style="list-style-type: none"> • Sheer Heart Attack - Queen's third studio album released in November 1974. 'Killer Queen' was written by Freddie Mercury and featured on • Queen - formed in London in 1970: singer Freddie Mercury, guitarist Brian May, drummer Roger Taylor and bassist John Deacon. • First single from the album - one of the few songs where Freddie Mercury wrote the lyrics first, which are about an upper-class prostitute. 	
Harmony	<ul style="list-style-type: none"> • Mainly root position chords. • Inversions - Some chords in first or second inversion. • Dissonance - some used (e.g. bar 30). • Seventh chords - (e.g. bar 4). • Circle of fifths - (e.g. bars 20–21). • Altered and extended chords - (e.g. F¹¹ bar 47). • Pedal - bars 27–30. 	
Tonality	<ul style="list-style-type: none"> • E♭ Major • Ambiguity - Opening in C minor and closing on an E♭ major chord, not always clear. • Passing modulations - many are used, strengthened by perfect cadences but often followed by parallel shifts, moving to a new key. 	
Structure	<ul style="list-style-type: none"> • Verse-chorus form: Intro-Verse 1-Chorus 1-Instrumental-Verse 2-Chorus 2-Guitar solo-Verse 3-Chorus 3-Outro. 	

Relating Notation durations to MIDI sequencer note lengths				
Note	Name	Duration	Piano Roll	Snap/Quantise
	Semibreve	4		1/1
	Dotted Minim	3		-
	Minim	2		1/2
	Dotted Crotchet	1 1/2		-
	Crotchet	1		1/4
	Dotted Quaver	3/4		-
	Quaver	1/2		1/8
	Triplet quavers	1/3 each		1/8 Triplet (1/12)
	Semiquaver	1/4		1/16

KEYWORDS

- 1-DAW (Digital Audio Workstation):** a digital system designed for recording and editing digital audio. It may refer to audio hardware, audio software, or both.
- 2-MIDI (Musical Instrument Digital Interface):** the interchange of musical information between musical instruments, synthesizers and computers.
- 3-MIDI controller:** any hardware or software that generates and transmits MIDI data to electronic or digital MIDI-enabled devices, typically to trigger sounds and control parameters of an electronic music performance.
- 4-Sequencer:** a software application or a digital electronic device that can record, save, play and edit audio files.
- 5-Arrange Window:** the main window of Logic Pro. It incorporates other Logic Pro editors and it's where you do most of your work.
- 6-Drum Machine:** An electronic device containing a sequencer that can be programmed to arrange and alter digitally stored drum sounds.
- 7-Tempo:** the pace or speed at which a section of music is played.
- 8-BPM (beats per minute):** how many beats in some song appear in a minute, and it describes the tempo of the song.
- 9-Rhythm:** the arrangement of sounds as they move through time.
- 11-Snap:** A function that causes audio, MIDI, or other events in a DAW to automatically "snap" or jump to the nearest division in a time "grid" in the DAW.
- 12-Quantise/Quantisation:** the rhythmic correction of audio or MIDI regions to a specific time grid.
- 13-Velocity:** the force with which a note is played, and it is vitally important in making MIDI performances sound human - or if you use a fixed velocity, making them sound mechanical.
- 14-Pitch:** how high or low a note is.
- 15-Pitch Bend:** an electronic device that enables a player to bend the pitch of a note being sounded on a synthesizer, usually with a pitch wheel, strip, or lever.
- 16-Scale:** any set of musical notes ordered by fundamental frequency or pitch. A scale ordered by increasing pitch is an ascending scale, and a scale ordered by decreasing pitch is a descending scale.
- 17-Fader:** a device for gradually increasing or decreasing the level of an audio signal.
- 18-Master fader:** The fader, which controls the main output(s) of the console during mixdown.

Relating staff pitches to DAW Piano & Drum rolls for inputting notes

KEY QUESTIONS

- Q1:** Each box in the editing window is worth what note & duration length? Semiquaver (1/4 beat)
- Q2:** On the Piano roll, which C is the same pitch as 'Middle C'? C3
- Q3:** What is the name of the DAW that we use? Logic Pro X
- Q4:** If I want to edit a note to be perfectly in time to the beat, I would use what function? Quantisation
- Q5:** The Kick on a drum machine/drum kit is on which key of the drum roll? C1 and/or B1

Relating staff pitches to DAW Piano & Drum rolls for inputting notes

C maj D min E min F maj G maj A min B dim

Root position first inversion second inversion

Bass Clef Notes

Line Notes:

Space Notes:

Good Boys Do Fine Always All Cows Eat Grass

Bass Clef Mnemonic

KEYWORDS

- 1- Sequencer:** a software application or a digital electronic device that can record, save, play and edit audio files.
- 2- Snap:** A function that causes audio, MIDI, or other events in a DAW to automatically “snap” or jump to the nearest division in a time “grid” in the DAW.
- 3- Quantise/Quantisation (pitch):** the correction of audio or MIDI regions to a specific scale/key.
- 4- Velocity:** the force with which a note is played, and it is vitally important in making MIDI performances sound human - or if you use a fixed velocity, making them sound mechanical.
- 5- Pitch:** how high or low a note is.
- 6- Pitch Bend:** an electronic device that enables a player to bend the pitch of a note being sounded on a synthesizer, usually with a pitch wheel, strip, or lever.
- 7- Scale:** any set of musical notes ordered by fundamental frequency or pitch. A scale ordered by increasing pitch is an ascending scale, and a scale ordered by decreasing pitch is a descending scale.
- 8- Treble Clef:** Used to signal the high-pitched notes in music.
- 9- Bass Clef:** Used to signal the low-pitched notes in music.
- 11- Chord:** 2+ notes played together, typically notes 1, 3, 5 of a scale.
- 12- Inversion:** putting the 3rd (1st inversion) or 5th (2nd inversion) in the bass of a chord.
- 13-Key:** the group of notes or scale that forms the basis of the piece.
- 14-Modulate:** Changing the key of a piece.
- 16- Fader:** a device for gradually increasing or decreasing the level of an audio signal.
- 17- Master fader:** The fader, which controls the main output(s) of the console during mixdown.

KEY QUESTIONS

- Q1:** On the Piano roll, which C is the same pitch as ‘Middle C’? **C3**
- Q2:** What is the mnemonic to remember the LINES on the bass clef? **Good Boys Do Fine Always**
- Q3:** What is the mnemonic to remember the SPACES on the bass clef? **All Cows Eat Grass**
- Q4:** If I want to edit notes to make sure they are in the right scale, I would use which function? **Quantisation (pitch/scale)**
- Q5:** A 1st inversion chord has which note in the bass? (e.g: in a C chords?) **3rd (E)**
- Q5:** A 2nd inversion chord has which note in the bass? (e.g: in a C chords?) **5th (G)**



Semana

¿Dónde vives?

I live in the...
north/northeast/northwest...
south/southeast/southwest...

este/oeste/centro...
de Inglaterra/Escocia
de Gales/Irlanda (del Norte) Ireland

¿Qué haces en verano?

En verano/invierno...
chateo en la red
cocino para mi familia
descargo canciones
escribo correos
hago natación/esquí/windsurf
hago una barbacoa
juego al baloncesto/fútbol

What do you do in summer?

In summer/winter...
I chat online
I cook for my family
I download songs
I write emails
I go swimming/skiing/windsurfing
I have a barbecue
I play basketball/football

monto a caballo/en bici
nado en el mar
salgo con mis amigos/as
toco la guitarra
trabajo como voluntario/a
veo la tele
voy al polideportivo/al parque/
a un centro comercial
voy de paseo

Semana

¿Con qué frecuencia?

siempre
a menudo
todos los días
a veces

How often?

de vez en cuando
una vez a la semana
dos o tres veces al año
(casi) nunca

from time to time
once a week
two or three times a year
(almost) never

¿Qué tiempo hace?

Hace buen/mal tiempo.
Hace calor/frío/sol/viento.
Llueve/Nieva.
El tiempo es variable.

What's the weather like?

It's good/bad weather.
It's hot/cold/sunny/windy.
It's raining/snowing.
The weather is changeable.

The climate is hot/sunny.
It's foggy/stormy.
There are showers.
It's cloudy.

¿Qué te gusta hacer?

Soy adicto/a a...
Soy un(a) fanático/a de...
ya que/dado que/puesto que
Prefiero...
I like...
Me encanta/Me mola/Me chifla/
Me flipa/Me apasiona...
No me gusta (nada)...
Odio...
A (mi padre) le gusta...
Nos encanta...
bucear
estar al aire libre

What do you like doing?

I'm addicted to...
I'm a ... fan/fanatic.
given that/since
I prefer...
I like...
I love...
I don't like... (at all)
I hate...
(My dad) likes...
We love...
diving
being outdoors

being in touch with friends
doing martial arts
doing water sports
going to the cinema/ice rink
going shopping
reading (loads of magazines)
using the computer
watching films
I prefer to spend the summer...
abroad/in Spain
on the coast/in the country
in the mountains/in the city

Semana

3

¿Adónde fuiste de vacaciones?

hace una semana/un mes/un año
hace dos semanas/meses/años
fui de vacaciones a...
Francia/Italia/Turquía
¿Con quién fuiste?
Fui...
con mi familia/insti

con mi mejor amigo/a
solo/a
¿Cómo viajaste?
Viajé...
en autocar/avión
en barco/coche/tren

with my best friend
alone
How did you travel?
I travelled...
by coach/plane
by boat/car/train

¿Qué hiciste?

primero
luego
más tarde
después
finalmente
Lo mejor fue cuando...
Lo peor fue cuando...
aprendí a hacer vela
comí muchos helados
compré recuerdos
descansé
fui al acuario
hice turismo

What did you do?

llegué tarde al aeropuerto
perdí mi móvil
saqué fotos
tomé el sol
tuve un accidente en la playa
vi un partido
visité el Park Güell
vomité en una montaña rusa
Puedes...
descubrir el Museo Picasso
disfrutar del Barrio Gótico
pasear por Las Ramblas
subir al Monumento a Colón
ver los barcos en el puerto

I arrived at the airport late
I lost my mobile
I took photos
I sunbathed
I had an accident on the beach
I saw/watched a match
I visited Park Güell
I was sick on a roller coaster
You can...
discover the Picasso Museum
enjoy the gothic quarter
walk along Las Ramblas
go up the Columbus Monument
see the boats in the port

Semana 4

¿Qué tal lo pasaste?

Me gustó/Me encantó.
Lo pasé bomba/fenomenal.
Lo pasé bien/mal/fatal.
Fue...
inolvidable/increíble
impresionante/flipante
horroroso

How was it?

I liked it/I loved it.
I had a great time.
I had a good/bad/awful time.
It was...
unforgettable/incredible
impressive/awesome
awful

a disaster
What was the weather like?
It was good/bad weather.
It was hot/cold/sunny/windy.
It was foggy/stormy.
It rained/snowed.



Semana 4 Parte 2

¿Cómo era el hotel? Me alojé/Me quedé... Nos alojamos/Nos quedamos... en un albergue juvenil en un apartamento en un camping en un hotel de cinco estrellas en un parador en una casa rural en una pensión Fui de crucero. Estaba... cerca de la playa en el centro de la ciudad en las afueras Era... acogedor(a) antiguo/a barato/a caro/a	What was the hotel like? I stayed... We stayed... in a youth hostel in an apartment on a campsite in a five-star hotel in a state-run luxury hotel in a house in the country in a guest house I went on a cruise. It was... near the beach in the centre on the outskirts It was... welcoming old cheap expensive	grande lujoso/a moderno pequeño/a ruidoso/a tranquilo/a Tenía/Había... No tenía ni... ni... No había ni... ni... Tampoco tenía... (un) aparcamiento (un) bar (un) gimnasio (un) restaurante (una) cafetería (una) lavandería (una) piscina cubierta mucho espacio para mi tienda	big luxurious modern small noisy quiet It had/there was/were... It had neither... nor... There was neither... nor... Nor did it have... a car park a bar a gym a restaurant a café a launderette an indoor pool lots of space for my tent
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Semana 5

¿Cómo era el pueblo? Lo bueno/Lo malo... del pueblo... de la ciudad... era que era... demasiado/muy/bastante... animado/a bonito/a histórico/a pintoresco/a	What was the town/village like? The good thing/The bad thing... about the town/village... about the city... was that it was... too/very/quite... lively pretty historic picturesque	turístico/a Tenía... mucho ambiente/tráfico mucho que hacer mucho contaminación/gente muchos espacios verdes muchos lugares de interés muchas discotecas	touristic It had... lots of atmosphere/traffic lots to do lots of pollution/people lots of green spaces lots of places of interest lots of discos
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Semana 6

¿Quisiera reservar... ¿Hay... wifi gratis... aire acondicionado... en el hotel/las habitaciones? ¿Cuánto cuesta una habitación...? ¿A qué hora se sirve el desayuno? ¿Cuándo está abierto/a el/la...? ¿Cuánto es el suplemento por...? ¿Se admiten perros? ¿Quisiera reservar... una habitación individual/doble con/sin balcón	I would like to book... Is/Are there... free wifi... air conditioning... in the hotel/the rooms? How much does a... room cost? What time is breakfast served? When is the... open? How much is the supplement for...? Are dogs allowed? I would like to book... a single/double room with/without balcony	con bañera/ducha con cama de matrimonio con desayuno incluido con media pensión con pensión completa con vistas al mar ¿Para cuántas noches? Para... noches del... al... de... ¿Puede repetir, por favor? ¿Puede hablar más despacio?	with a bath/shower with double bed with breakfast included with half board with full board with sea view For how many nights? For... nights from the... to the... of... Can you repeat, please? Can you speak more slowly?
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Quiero quejarme Quiero hablar con el director. Quiero cambiar de habitación. El aire acondicionado... El ascensor... La ducha... La habitación... está sucio/a La luz... no funciona Hay ratas en la cama.	I want to complain I want to speak to the manager. I want to change rooms. The air conditioning... The lift... The shower... The room... is dirty The light... doesn't work There are rats in the bed.	No hay... Necesito... papel higiénico jabón/champú toallas/(un) secador ¡Socorro! Es inaceptable. Lo siento/Perdone. El hotel está completo.	There is no... I need... toilet paper soap/shampoo towels/a hairdryer Help! It's unacceptable. I'm sorry. The hotel is full.
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Semana 7

Quiero quejarme Quiero hablar con el director. Quiero cambiar de habitación. El aire acondicionado... El ascensor... La ducha... La habitación... está sucio/a La luz... no funciona Hay ratas en la cama.	I want to complain I want to speak to the manager. I want to change rooms. The air conditioning... The lift... The shower... The room... is dirty The light... doesn't work There are rats in the bed.	No hay... Necesito... papel higiénico jabón/champú toallas/(un) secador ¡Socorro! Es inaceptable. Lo siento/Perdone. El hotel está completo.	There is no... I need... toilet paper soap/shampoo towels/a hairdryer Help! It's unacceptable. I'm sorry. The hotel is full.
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Mis vacaciones desastrosas Por desgracia Por un lado... por otro lado... El primer/último día Al día siguiente Tuve/Tuvimos... un accidente.../un pinchazo un retraso/una avería Tuve/Tuvimos que... esperar mucho tiempo llamar a un mecánico Perdí/Perdimos... el equipaje/la cartera la maleta/las llaves	My disastrous holiday Unfortunately On the one hand... on the other hand... (On) the first/last day On the following day I had/We had... an accident/a puncture a delay/a breakdown I had to/We had to... wait a long time go to the hospital/to the police station call a mechanic I lost/We lost... the luggage/the wallet the suitcase/the keys	Cuando llegamos... era muy tarde estaba cansado/a la recepción ya estaba cerrada acampar alquilar bicicletas coger el teleférico chocar con hacer alpinismo volver el paisaje la autopista preciosa	When we arrived... it was very late I was tired the reception was already closed to camp to decide (to) to hire bicycles to catch/take the cable car to crash into to go mountain climbing to return the landscape the motorway beautiful
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M1 Semaine 1

Family members

stepfather/father-in-law
stepmother/mother-in-law
brother-in-law
sister-in-law
half-brother/stepbrother
half-sister/stepsister

La famille

le beau-père
la belle-mère
le beau-frère
la belle-sœur
le demi-frère
la demi-sœur

la fille
le fils
l'enfant/le petit-enfant
le mari/l'ex-mari (m)
la femme/l'ex-femme (f)

daughter
son
(grand)child
(ex)husband
(ex)wife

M1 Semaine 2

Personality adjectives

He/She is ...

annoying
likeable
amusing/funny
arrogant
talkative/chatty
charming
funny
selfish
loyal
strong
generous
kind

Les adjectifs de personnalité

Il/Elle est ...
agaçant(e)
aimable
amusant(e)
arrogant(e)
bavard(e)
charmant(e)
drôle
égoïste
fidèle
fort(e)
généreux/-euse
gentil(le)

impatient(e)
jaloux/-euse
méchant(e)
paresseux/-euse
poli(e)
sage
sensible
sérieux/-euse
sympa(thique)
têtu(e)
travailleur/-euse
triste

impatient
jealous
nasty/mean
lazy
polite
well-behaved, wise
sensitive
serious
nice
stubborn/pig-headed
hard-working
sad

M1 Semaine 3

My physical description

I have ... hair

short/long/mid-length
straight/curly
black/brown/chestnut
blond/red/grey/white
I have ... eyes
blue/green
grey/brown
I have ... spots

Ma description physique

J'ai les cheveux ...
courts/longs/mi-longs
raides/bouclés/frisés
noirs/bruns/châtain
blonds/roux/gris/blancs
J'ai les yeux ...
bleus/verts
gris/marron
J'ai ...
des boutons

une barbe/une moustache

Je suis ...
petit(e)/grand(e)
de taille moyenne
mince/gros(se)
beau/belle
joli(e)
moche
Je porte des lunettes.

a beard/a moustache
I am ...
short/tall
of average height
slim/fat
beautiful
pretty
ugly
I wear glasses.

M1 Semaine 4

In town

night club
bowling alley
café
shopping centre
cinéma
shops
ice rink
swimming pool
beach

En ville

la boîte de nuit
le bowling
le café
le centre commercial
le cinéma
les magasins (m)
la patinoire
la piscine
la plage

le théâtre
dans
derrière
devant
entre
en face de
à côté de
près de

theatre
in
behind
in front of
between
opposite
next to
near

M1 Semaine 5

When?

today
tomorrow
the day after tomorrow

ce matin
cet après-midi
ce soir

this morning
this afternoon
tonight

M1 Semaine 6

Friendship

A good friend is ...
in a good mood
understanding
balanced/level-headed
honest
independent
modest
patient
self-confident

Un(e) bon(ne) ami(e) n'est pas ...
de mauvaise humeur
déprimé(e)
pessimiste
prétentieux/-euse
vaniteux/-euse
Il/Elle ...
croit en moi
dit toujours la vérité
me fait rire
prend soin de moi
voit le bon côté des choses

A good friend is/is not ...
in a bad mood
depressed
pessimistic
pretentious
conceited
He/She ...
believes in me
always tells the truth
makes me laugh
takes care of me
sees the positive side of things



M1 Semaine 7

Les traits de personnalité
 le sens de l'humour
 la patience
 la générosité
 la gentillesse

Qualities
 a sense of humour
 patience
 generosity
 kindness

la fidélité
 la modestie
 l'honnêteté (f)
 l'optimisme (m)

M2 Semaine 1

Les rapports en famille
 se confier à
 se disputer avec
 s'entendre bien avec
 se fâcher contre
 s'intéresser à

Family relationships
 to confide in
 to argue with
 to get on well with
 to get angry with
 to be interested in

to look after
 to love each other
 to bicker with each other
 dead
 divorced
 separated

M2 Semaine 2

On décrit sa famille
 adorable
 débrouillard(e)
 dynamique
 énergique/plein(e) d'énergie

Describing family members
 adorable
 resourceful
 lively
 energetic

extraverti(e)
 fragile
 instable
 introverti(e)

M2 Semaine 3

On va sortir
 Je vais/Tu vas/On va ...
 aller au match
 faire les magasins
 faire du patin à glace/du patinage
 manger au fast-food
 aller au cinéma
 faire du skate
 voir un spectacle
 jouer à des jeux vidéo
 venir chez moi

Going out
 I'm going/You're going/We're going...
 to go to the match
 to go shopping
 to go ice-skating
 to eat in a fast-food restaurant
 to go to the cinema
 to go skateboarding
 to see a show
 to play video games
 to come to my house

Tu veux venir?
 Tu peux venir?
 On se retrouve quand?
 ... où?
 ... à quelle heure?
 Tu y vas avec qui?
 ... comment?
 D'accord.
 A plus!/A plus tard!

M2 Semaine 4

On décrit une sortie
 hier soir
 à 20 heures
 d'abord
 après
 puis/ensuite
 J'ai .../Il/Elle a .../Nous avons ...
 visité le musée
 vu un match/une exposition
 mangé dans un restaurant
 refusé de manger
 bu un coca

Describing a night out
 last night
 at 8 p.m.
 first of all
 afterwards
 then
 I .../He/She .../We ...
 visited the museum
 saw a match/an exhibition
 ate in a restaurant
 refused to eat
 drank a cola

dit «au revoir»
 embrassé ...
 Je suis .../Il/Elle est .../Nous sommes ...
 allé(e)s à un pub
 resté(e)s dehors sur la terrasse
 entré(e)s dans un restaurant
 sorti(e)s
 parti(e)s
 monté(e)s dans le bus
 rentré(e)s à la maison
 tombé(e)s amoureux/-euse(s)

M2 Semaine 5

Parler de son enfance
 Quand j'étais plus jeune, ...
 j'habitais avec (mon papa et ma maman)
 j'allais à l'école primaire
 j'avais (les cheveux blonds)
 j'étais (mignon(ne))

Talking about your childhood
 When I was younger, ...
 I lived with (my mum and dad)
 I went to primary school
 I had (blond hair)
 I was (cute)

je jouais (à «cache-cache»)
 j'aimais (les bonbons)
 je détestais (les épinards)
 je portais (un maillot du PSG)
 je rêvais d'être ...

M2 Semaine 6

Qui est-ce que tu admires?
 Mon modèle s'appelle ...
 Moi, j'admire ...
 Mon héros/mon héroïne, c'est ...
 J'aimerais bien être comme lui/elle.
 J'admire sa créativité.
 Il/Elle ...
 m'impressionne énormément
 a travaillé très dur pour devenir ...
 est devenu(e) ...

Who do you admire?
 My role model is called ...
 Personally I admire ...
 My hero/heroine is ...
 I would like to be like him/her.
 I admire his/her creativity.
 He/She ...
 impresses me a lot
 worked very hard to become ...
 became ...

aide/a aidé ...
 a/avait du courage/de la détermination
 est/était courageux/-euse face à
 des dangers terribles
 lutte/a lutté pour ...
 a obtenu ...
 a sauvé la vie de ...
 C'est un enfant adopté, comme moi.

Each test is made of 20 questions.
 Previous week vocabulary can be used.



Vocabulary	
Primary data	Data you have collected yourself
Secondary data	Data that comes from published sources
Qualitative data	Data that uses words
Quantitative data	Data that uses numbers
Discrete data	Quantitative data that which is counted
Continuous data	Quantitative data which is measured
Bivariate data	Data sets that uses two variables
Ranked data	Discrete data that is put in order
Hypothesis	A hypothesis is a statement of belief about some aspect of a population
Control	A control in an experiment is designed to check the hypothesis, and is compared to the standard.
Population	All the data that you are interested in
Sample frame	A list that includes every population from which a sample is to be taken
Sample	A sample can be taken and used to make predictions about a population.
Pilot study	Using a small sample of data to see if meaningful results can be obtained

Important Ideas

Categorical data can be sorted in to groups of data types.

You can carry out experiments or make observations to see if your hypothesis is supported by the data you collect.

Question	Answer
Data types	
What type of data is the following: 1) Number of seagulls on a beach 2) The weight of a bag of sugar 3) The name of a town 4) The score you got on your last test 5) The time taken to run a marathon	1) Quantitative – discrete 2) Quantitative – continuous 3) 3) Qualitative 4) Quantitative – discrete 5) Quantitative - continuous
Sampling	
Sarah wants to find out how many of the 250 students in his year bring a mobile phone to school. She decides to ask 10 of his friends (a) Write down two reasons why this is not a good sample (b) Explain how Sarah could take a better sample	(a) It's too biased - her friends are likely to do similar things - the sample is too small. (b) She should take a random sample of 30 or more using a list of all the students in her year.
Experimental design	
Maliq wants to know whether drinking a certain tea will help with weight loss. Design an experiment for Maliq.	1) Select two groups of people at random 2) Weigh each person 3) One group drink the tea. 4) Re-weigh all the people after a certain amount of time.

Key Facts & Formula	
Samples	<p>GOOD samples:</p> <ul style="list-style-type: none"> • Are as large as possible • Are unbiased • Have a suitable time frame <p>BAD samples:</p> <ul style="list-style-type: none"> • Are too small • Are biased • Are out of date, have people missing or counted twice, incorrect names on the list
Designing investigations	<p>The DATA HANDLING CYCLE:</p> <ul style="list-style-type: none"> • Specify the problem and plan • Collect data from a variety of sources • Process and represent the data • Interpret and discuss data
Estimation	<p>You can infer characteristics of a population using estimation and sampling:</p> <p>Proportion of sample with that characteristic x population size</p>

Important Ideas

Samples don't give you information about every member of the population so the data can be less accurate and may be biased

You can use summary statistics to make estimates of population characteristics

Vocabulary

Random sampling	Every member of the population has an equal chance of being selected.
Stratified sampling	Stratified sampling gives the different groups in the same sample an amount of representation that's proportional to how big they are in the population.
Judgement sampling	Uses judgement to select a sample that is representative of the population
Opportunity sampling	Uses the people or objects that are available at the time.
Cluster sampling	Used when the population is in groups. A random sample of these groups is selected and all items in the selected groups are include in the sample.
Quota sampling	Splitting the population into groups with certain characteristics and selecting a given number from each group.
Systematic sampling	Items are selected from the population at regular intervals either in time or in space.
Explanatory variable	The "cause" variable
Response variable	The "effect" variable
Extraneous variable	A variable you are not interested in which could affect your results

Question	Answer
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Population and sampling	
You want to find out the average amount of pocket money received by students in your school. Describe how you would get a random sample of 40 from a population of 748 students.	Get a list of all 748 students (a sample frame) and number them 1 to 748. Generate 40 random numbers (using a random number table or computer) between 1 and 748. Match the 40 random numbers to the students to create the sample.
Estimation	
Evelyn captures 30 frogs from her garden pond and carefully marks each before returning them to the water. The next day she captures 20 frogs and finds that 10 are marked. Estimate the number of frogs in her pond.	$\frac{30}{N} = \frac{10}{20}$ $\Rightarrow N = 60 \text{ frogs}$
Collection of data	
Rajan plans to distribute his questionnaire about public transport by handing out copies in his town centre	a) Advantage – it should be quick and cheap to carry out. Disadvantage – the results may be biased depending on who takes a questionnaire and who responds.
a) Give one advantage and one disadvantage of Rajan's plan for collecting data	b) He could enter people who respond in a prize draw
b) B) Suggest one way Rajan could reduce the number of non-responses	

Key Facts & Formula

	Advantage	Disadvantage
Questionnaire	<ul style="list-style-type: none"> Much cheaper to do Each person answering the question is treated the same way 	<ul style="list-style-type: none"> Non-response People may misunderstand some questions
Interview	<ul style="list-style-type: none"> Interviewer can explain complex questions Interviewer can follow up on unclear responses 	<ul style="list-style-type: none"> Interviewer may be biased Can be costly

$\frac{n}{N} = \frac{m}{M}$	
Petersen Capture-recapture	<p>Assumptions:</p> <ul style="list-style-type: none"> No significant change to population All members of the population are equally likely to be captured. Capture and marking does not affect recapture & markings are not lost Sample is big enough to be representative
Stratified sampling	<p>Number in sample for each stratum:</p> $\frac{\text{stratum size}}{\text{population size}} \times \text{number in sample}$

