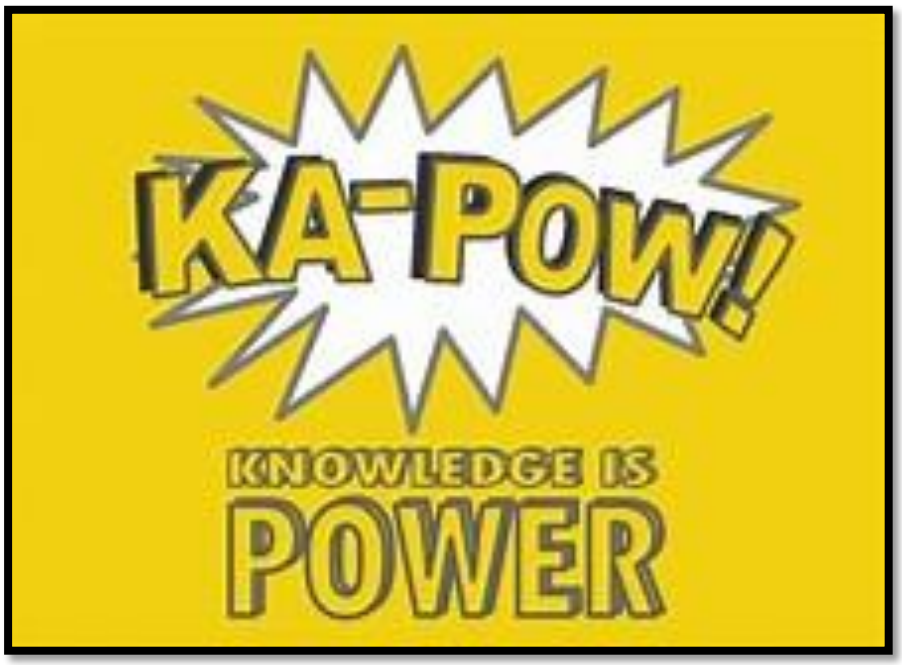
Year 9

Knowledge Organiser

Booklet

Half Term 4



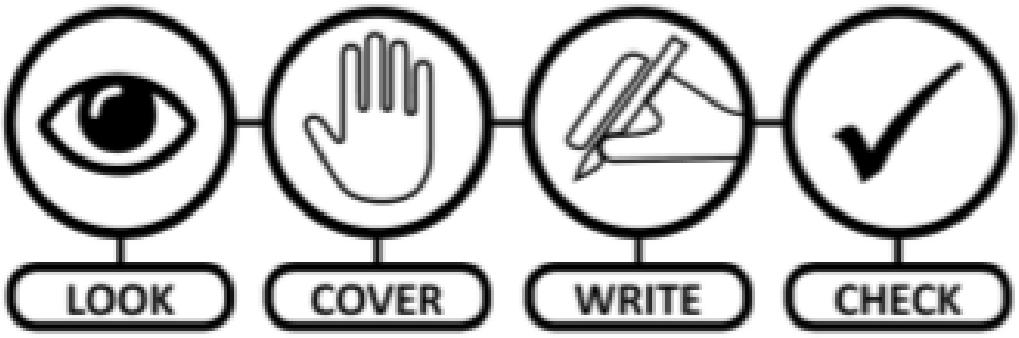
Name

Self-Quizzing Book

Knowledge organisers contain **critical** knowledge you must know. They will help **you remember more** and learn complex information and concepts. Using knowledge organisers will make you more successful in your subjects.

You need to bring your knowledge organiser booklet and self-quizzing book with you **every day**.

For homework you will be asked to self-quiz using your knowledge organisers. You will do this in this book using look, cover, write, check.



Look: Spend a small amount of time reading a section of the knowledge organiser and trying to memorise the content.

Cover: Cover up that section of your knowledge organiser.

Write: In your self-quizzing book, write out the information you have tried to memorise from the knowledge organiser.

Check: Uncover the section of your knowledge organiser and check every word, including spellings. Make any corrections using a **green pen**. If it is all correct, tick what has been written.

Repeat this process until **one whole page** of your self-quizzing book is full, with **no whole lines left empty**.

Respect **Resilience** **Responsibility**

Expectations

You should be proud of the work you produce and how hard you have worked.

There should be no wasted space on each page.

No whole lines should be left empty.

Corrections should be made in a **green pen**.

Example

Subject, underlined

Date in full, underlined

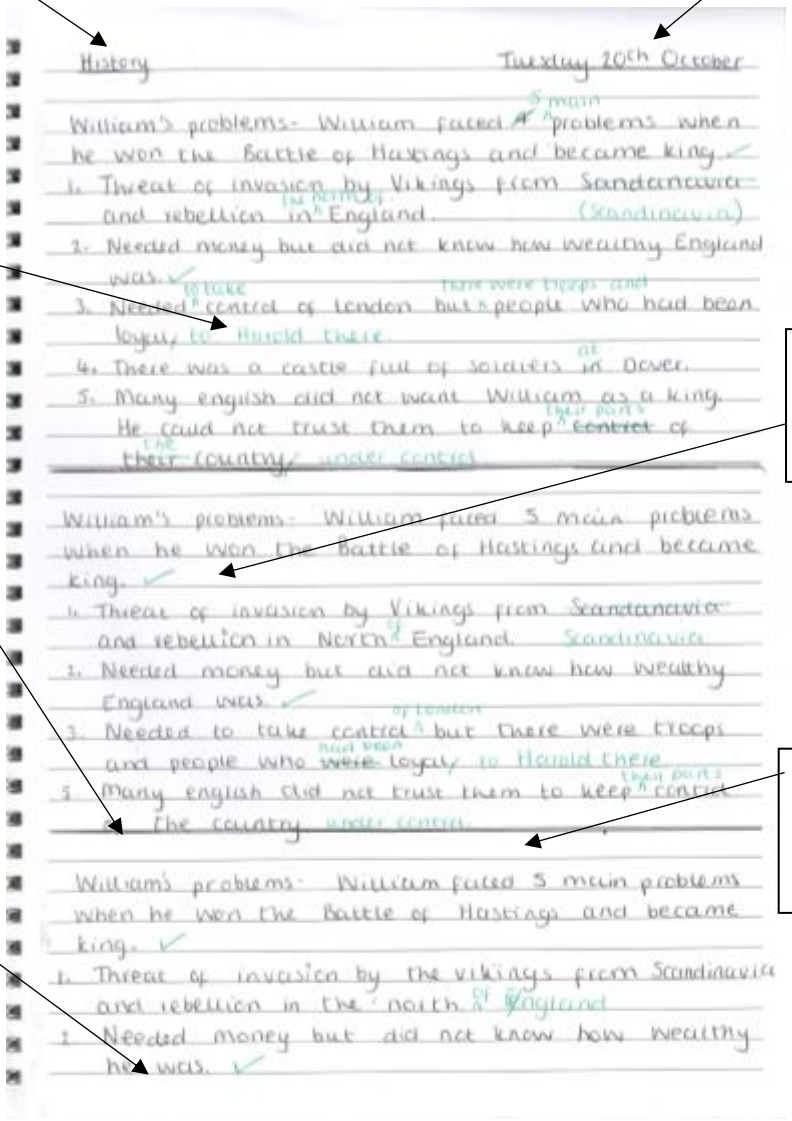
Corrections made in green pen.

Each line checked and ticked if correct.

Solid black line after each attempt

No whole lines left empty except between repeats.

Repeat until the whole page is full



History — Tuesday 20th October

William's problems- William faced 5 main problems when he won the Battle of Hastings and became king. ✓

1. Threat of invasion by Vikings from Scandinavia and rebellion in N England.
2. Needed money but did not know how wealthy England was. ✓
3. Needed control of London but people who had been loyal to Harold there
4. There was a castle full of soldiers in Dover.
5. Many english did not want William as a king. He could not trust them to keep control of their county.

William's problems- William faced 5 main problems when he won the Battle of Hastings and became king. ✓

1. Threat of invasion by Vikings from Scandinavia and rebellion in North England.
2. Needed money but did not know how wealthy England was. ✓
3. Needed to take control but there were troops and people who were loyal to Harold there
5. Many english did not trust them to keep control of the county.

William's problems- William faced 5 main problems when he won the Battle of Hastings and became king. ✓

1. Threat of invasion by the vikings from Scandinavia and rebellion in the north of England
2. Needed money but did not know how wealthy he was. ✓

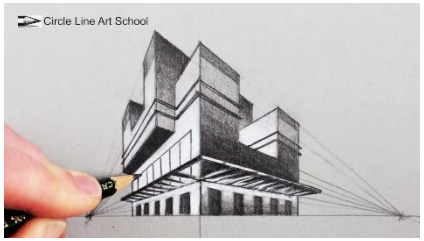
Respect **Resilience** **Responsibility**

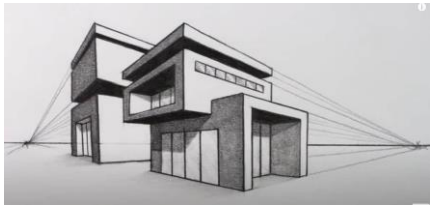
YR9 ART – Urban/Architecture

URBAN ARCHITECTURE

Urban architecture involves the design of homes, towns and cities, streets and spaces. Often architecture is made of linear (straight) lines but can also be influenced by organic (natural) shapes such as honeycombs.

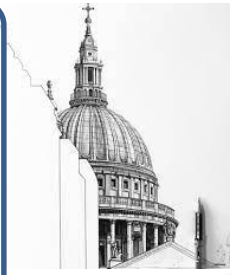
Architectural drawings like these artists can involve measurements, precise lines and perspective (3D depth).





Artist **Ian Murphy** creates mixed media drawings of ornate (old and well decorated) doorways and windows.

He uses layering of different materials to build up texture and tone, giving it a detailed and aged atmosphere.



AO1 Artist Research

Minty Sainsbury draws famous landmarks and iconic buildings. He puts a lot of effort into recording (drawing) the details. He also obscures (covers) the images by putting the shapes of new buildings over them. These are all white to show how built up cities have become and the more interesting and unique buildings are now disappearing behind a wall of glass and metal structures.

The main concepts (ideas) of the Boyle Family –

- Photography/casts and Photorealist painting of 3d sculptures to capture an area.
- **Random** selection techniques to isolate a rectangle of the Earth's surface.
- Nothing is excluded as a potential subject; the particular is chosen to serve as a representative of the whole.
- No motive on behalf of the artist, they attempt to present a slice of reality as they found it at the moment of selection
- Earth studies: three dimensional casts of the surface of the earth which record and document random sites with great accuracy.
- These works **combine real material** from the site (stones, dust, twigs etc) with paint and resins.

Shamekh Al-Bluwi

Using nothing but his surroundings and some paper cut-outs, artist **Shamekh Al-Bluwi** creates one-of-a-kind dress designs, putting a unique spin on fashion illustration.

He carefully selects a background that is interesting and considers the formal elements: Line, Shape, Form, Tone, Colour, Pattern, Texture.

Year 9 DT

Make sure you memorise ACCESSFM, and use this to analyse 3 products in your Kitchen.

Design Strategies

You can use design strategies to come up with initial design ideas without getting you on a bad one. Designing is a really complex process and there are several different ways of doing it:

User-Centred design: The wants and needs of the client are prioritised- their thoughts are given a lot of attention at every stage of design and manufacture

When you are designing a product it is easy to get stuck on a particular idea. This is called design fixation and it can stop you thinking creatively and coming up with innovative ideas.

Following the design strategy can help you avoid design fixation and encourage you to look at your design in a critical way to make improvements. Other ways to avoid are-

- Collaboration
- Honest feedback
- Focusing on new solutions
- Using fresh approaches

You can also annotate your designs to fully explain further using ACCESSFM

A= Aesthetics
C= Cost
C= Customer
E= Environment
S= Size
S= Safety
F= Function
M= Materials

Find an existing design and use this formula ACCESS FM to analyse your products.

Cross curriculum topics

Science

- Structure of polymers
- How long does it take for plastic to degrade?

Geography

- Impact of pollution on the wider world.
- How has the geography landscape changed with the rise in pollution?

Maths

- Sizing and tolerances of products
- Use of time within a practical task

English

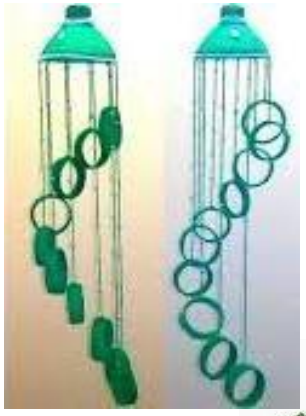
- Justification of practical choices, evaluation techniques and improvement comments

History

- What materials were used before plastics? How in history have other countries dealt with pollution?

PSHE

- Creation of sensory items for the health hub and sensory garden at OSSMA












Drama
Year 9
Performing Arts

Costume design

Costume is an important aspect of a production, as it helps to: establish a character, convey the context of the play and support the style of the production. Other aspects to consider when designing a costume include: accessories, hair and make-up, practicalities, shape and texture. Colour is a very important aspect as it can convey as symbolic idea or reveal something about the character.

Vocal skills

Accent: Accent refers to a particular way of talking and pronouncing words, and is associated with a geographical area or social class.
Volume: Volume refers to how loud or quiet the voice is. While performers will need to be loud enough to be heard by everyone in the audience, they can change their volume to express a character's emotions.
Tone: Tone is the emotional sound of the voice, eg frightened, angry or joyful, and is very important in revealing the subtext of a line.
Emphasis: Emphasis is where a performer will stress a particular word or phrase within a sentence to indicate importance.
Pace: Pace is the speed at which lines are delivered. The speed of speech can often convey how someone is feeling.
Rhythm: Rhythm is related to pace, and refers to the pattern of sound when speaking.
Pause: A pause (or beat) is a short break in speech for dramatic effect. A performer may choose to pause to show hesitation, that they are overwhelmed with emotion, or that they are thinking.
Pitch: Pitch is how high or low the voice sounds
Quality: Quality refers to the basic sound of the voice and is largely influenced by how sound moves through the vocal folds.
Resonance: Resonance refers to the placement of the voice and where the sound resonates, eg in the chest, throat or nose.

Lighting design

One of the most important functions of lighting design is illuminating the action on stage. Lighting is needed so that the audience can see clearly what is happening.

Lighting can help to create mood and atmosphere on stage. For example, to create a cold, damp jail cell, a lighting designer might use a cool, blue light with a low intensity.
When designing lighting, there are several aspects to consider, including: colour, focus, intensity, position and direction.

Stage design

The set helps show where and when the story of a play takes place, while also conveying meaning to the audience.
When designing a set, there are several aspects to consider, including: colour, condition, practicalities and scale. Designers will also consider: shape, staging configuration, texture, transition and health and safety.

Projections are becoming more common within set design and can be used to add detail and texture on stage.
A flat is a piece of scenery used to represent a wall or to conceal a backstage area.
Revolves are sometimes uses which is a turntable built into the stage floor on which scenery can be set and turned.

Physical skills

Body language: Body language includes posture and stance and can convey a character's feelings or personality.
Eye contact: Eye contact is the state in which two people look directly into one another's eyes. It can be used to reveal the status and relationship between characters.
Facial expressions: Facial expressions are the way the face moves to convey an emotional state.
Gait: Gait is a person's manner of walking. The way a performer walks on stage will form part of their characterisation.
Gesture: Gesture is the way people communicate with their hands or other parts of the body. It can be used to show a character's emotions, eg shaking a fist to represent anger.
Pace: Pace is the speed of a performer's movement. As well as focusing on pace individually, the pace of movement within a scene can completely change the atmosphere on stage.
Space: Space refers to how performers or items are positioned on stage. The process of placing performers in a specific space is called blocking.
Levels: Levels refer to the use of different heights, eg through standing or sitting, to convey meaning on stage. They can be used to create visual interest but they can also signal status and character relationships.

Year 9 – Romeo and Juliet

Act	PLOT
1 Fights and a Party	Prologue: Family feud & fatal consequences for 2 young lovers • There is a fight between two rival families (Montagues and Capulets) which is stopped by the Prince. • Romeo is unhappy because Rosaline doesn't love him. • Paris asks Capulet for Juliet's hand in marriage, but Capulet tells him she's not ready. Capulet throws a ball. • Mercutio is invited to the ball, but Benvolio and Romeo crash it. This enrages Tybalt. • Romeo and Juliet meet, talk, fall in love at first sight and kiss.
2 A Secret Marriage	• In the Capulets' garden, Romeo overhears Juliet thinking aloud about how much she likes Romeo but is the son of her family's enemy. Romeo talks to her and they decide to get married. • Romeo asks Friar Lawrence for help – he agrees to marry them. • Romeo meets Mercutio and Benvolio, and they tease the Nurse who gives a message to Romeo from Juliet. • After the Nurse tells Juliet the plan to marry that afternoon, they get married in secret.
3 Deaths	• Tybalt kills Mercutio in a fight; in revenge, Romeo kills Tybalt. The Prince exiles Romeo from Verona as punishment. • R & J spend the night together before R leaves the city. • Juliet's parents tell her that she must marry Paris in two days but she tells them she can't. during an intense argument.
4 Plans and Potions	• Juliet asks the friar to help, whose plan involves faking her death. • Using Friar Lawrence's potion, Juliet fakes her own death. Friar Lawrence sends Romeo a letter telling him about the plan and to rescue her from her family tomb. • Juliet's family think she's dead so bury her in the family tomb.
5 Un-happy Ending	• R doesn't get the Friar's letter. He believes J to be dead and goes to her tomb to kill himself after buying some poison. • Paris sees Romeo going to the tomb, they fight and R kills Paris. • R places P's body in the tomb, lies next to Juliet and drinks the poison. • Friar Lawrence finds out that R didn't get the letter so goes to the tomb. • As Friar Lawrence arrives, Juliet wakes up. Juliet refuses to go with him and he doesn't want to get into trouble for Romeo's death, so the Friar leaves. • When Juliet realises that Romeo is dead, she kills herself. • Everyone comes to the tomb, where the friar has to explain what has happened. • Grieving, Montague and Capulet realise that their feud has caused the suicides of their children so agree to make peace.

CONTEXT

Verona: R & J set in Verona in the fourteenth century. Verona was a rich, lively, cultured city but had been afflicted by violence for centuries. Political leaders clashed with religious leaders for power, status and wealth and many people were obliged to take sides.

Women: Society in the 16th century was patriarchal: men were dominant and women were inferior and expected to marry as young as 12. Noblewomen like Juliet would have received some education but there was little freedom in most areas of life for women. Lower class women received no education and would have worked as some sort of servant.

Queen Elizabeth I: Provided a powerful example of a strong female in a male-dominated society, living by rules established by men. She was not representative of women in wider English society and was celebrated as an exceptional woman. Admired by Shakespeare and led England to great wealth, prosperity and national confidence.

Tragic Hero: *Romeo and Juliet* is a tragedy and the characters of Romeo and Juliet can be seen as *tragic heroes* (main character whose downfall brought about by own actions or *tragic flaw*). Both are guilty of loving too much and too quickly and acting too rashly.

The Plague: Elizabethan England and Renaissance Verona were badly affected by outbreaks of the painful, deadly and contagious 'black death'. Many parents (including Shakespeare) lost children to the plague and it provides a metaphor for Mercutio's final curse as the Montagues and Capulets all lose children. Romeo doesn't get Friar Lawrence's letter because Friar John s detained for fear he may have the plague.

THEMES

LOVE: *R & J fall in true love at first sight. Their young love is genuine but impulsive and destructive. Romeo's 'love' for Rosaline is an passing infatuation and Romeo learns what true love is. There are numerous puns and jokes about sex, and R&J's relationship reflects physical desire too.*

CONFLICT & HONOUR: *Personal and family reputation was crucial in the 16th century. Honour is important to all the characters – they can't ignore insults and have to defend the honour of their family. Characters like Benvolio and the Prince show how difficult it is to avoid the violence of the family feud. The violence gets worse in the second half of the play and the feud only stops because of the deaths of R & J.*

GENDER: *Women in the play are able to exert little influence. Capulet sees Juliet as his property and feels that she should be grateful for the match with Paris he has arranged. Juliet very aware that virtue and chastity were more important and valuable to women than men as they had to be chaste to secure a good marriage.*

FAMILY & MARRIAGE: *Wealthy people often married not for love but for money, power and status; arranged marriages were common; Capulet tries to use Juliet as a 'bargaining chip'. The family was society in microcosm with the father as 'governor'. Juliet is torn between duty to her family and desire for personal happiness. R & J willing to give up their families for marriage. The young were expected to obey the old and Shakespeare celebrates the passion and independence of R & J.*

FATE: *The prologue establishes the idea that fate, not just the characters' actions, is to blame for the catastrophes. Many instances of luck impact on the characters such as the servant inviting Romeo to the ball, Friar John and his message being detained, Paris being at the Capulet tomb when Romeo arrives*

RELIGION: *A powerful influence in the 16th century and it provided a set of moral rules to live by. Represented by Friar Lawrence who is trusted by all. R & J had to marry in order to be together. Religious imagery and references often used by characters.*

VOCABULARY

Belligerent: Aggressive and hostile	**Dutiful:** Acts obediently	**Impulsive:** Acts without thinking	**Despair:** total loss of hope
Idolatry: Extreme admiration or love	**Conflict:** A struggle between opposites	**Melancholy:** Feeling of thoughtful sadness	**Infatuation:** Obsession
Banishment: Exile	**Tyrannical:** treats people cruelly	**Tormented:** experience great suffering	**Confidant:** A trusted person

Year 9 – Character Overviews

ROMEO

Well-respected Montague. Falls in love with the daughter of his family's enemy and marries her in secret – kills her cousin in a rage and commits suicide wrongly believing Juliet to be dead.

Initially knows more about love from books than experience: "thy love did read by rote" (Friar Lawrence)/ "Love is a smoke raised with the fume of sighs…a fire…a sea…a madness" / "young waverer" (Friar Lawrence) / "you kiss by th' book" (Juliet)
Emotional, passionate and has to deal with rejection by Rosaline: "Is love a tender thing? It is too rough,. Too rude, too boisterous, and it pricks like thorn."
Fears fate & future: "O! I am Fortune's fool!"
Falls overwhelmingly in love with Juliet at first sight: "what light through yonder window breaks? It is the east and Juliet is the sun." / "speak again bright angel" / "O, she doth teach the torches to burn bright" / "Did my heart love till now?"/"faithful vow"
Challenges barriers to Juliet: "with love's light wings did I o'erperch these walls"
Tries to avoid fighting but worries that he's less manly: "good Capulet, which name I tender / As dearly as my own, be satisfied" / "O sweet Juliet, Thy beauty hath made me effeminate And in my temper softened valor's steel!"
Hot-headed, enraged by the killing of Mercutio: "fire-ey'd fury be my conduct now!"
Devastated by exile to Mantua: "Ha, banishment! Be merciful, say 'death'…Heaven is here, Where Juliet lives"
Horrified by news of Juliet's death and decides to commit suicide: "I defy you stars…Juliet, I will lie with thee tonight."
Gives violent warning to Balthazar not to interfere with his suicide: "I will tear thee joint by joint And strew this hungry churchyard with thy limbs."
Urges Paris not to challenge him outside the Capulet tomb: "I beseech thee, youth, Put not another sin upon my head By urging me to fury."
Sees Juliet is still beautiful in 'death': "Death, that hath sucked the honey of thy breath, Hath had no power yet upon thy beauty. Thou art not conquered."
Dies as he began the play, by expressing love: "Thus with a kiss I die."

MERCUTIO Romeo's friend, playful, witty but aggressive – gets caught in the middle of the feud

Tells Romeo to get over Rosaline: "If love be rough with you, be rough with love.**"**
Appalled by Romeo's refusal to fight Tybalt: "O calm, dishonorable, vile submission"
Dies cursing both families: "A plague o' both your houses"

FRIAR LAWRENCE

Like a father to Romeo – wise, trusted, tries to help but actions lead to R & J deaths

Sees opportunity to resolve feud: "For this alliance may so happy prove,
To turn your households' rancour to pure love."
Worries about consequences of R&J's love: "These violent delights have violent ends"
Criticises Romeo's reaction to exile: "Art thou a man? … Thy tears are womanish." / "Unseemly woman in a seeming man" / "A pack of blessings light upon thy back"

TYBALT Juliet's cousin – aggressive and consumed with hatred for the Montagues

Hateful, angry: **"**peace? I hate the word, As I hate hell, all Montagues, and thee." / "…a Montague. Fetch me my rapier, boy." / "To strike him dead I hold it not a sin."
Obsessed with family honour: "Now by the stock and honour of my kin"
Determined to kill Romeo: "Boy, this shall not excuse the injuries
That thou hast done me. Therefore turn and draw."

JULIET

13-year-old Capulet. Defies family and gender expectations to marry the son of her family's enemy – overcome by grief at Romeo's death and commits suicide

Young and innocent: "My child is yet a stranger in the world. She hath not seen the change of fourteen years."
Idolised by her father: "She's the hopeful lady of my earth." / "My will to her consent is but a part"
Falls in love with Romeo at first sight: "Then have my lips the sin that they have took." / "If he be married, My grave is like to be my wedding bed."
Cautious about her love for Romeo: "It is too rash, too unadvised, too sudden,
Too like the lightning,"
Conflicted between family loyalty and love for Romeo: "O Romeo, Romeo! wherefore art thou Romeo?" / "What's in a name? That which we call a rose, By any other word would smell as sweet." **/** "My only love sprung from my only hate!"
Prepared to defy her family and the feud: "Deny thy father and refuse thy name..be but sworn my love, And I'll no longer be a Capulet."
Commits herself to Romeo: "my true love is grown to such excess I cannot sum up sum of half my wealth."
Impatient to be with Romeo after wedding: "Spread thy close curtain, love-performing night" / O, I have bought the mansion of a love, But not possessed it, and though I am sold, Not yet **Conflicted about Romeo after he kills Tybalt: "**O serpent heart hid with a flowering face!" / "Beautiful tyrant! Fiend angelical!"
Refuses father's order to marry Paris: "Delay this marriage for a month, a week. Or, if you do not, make the bridal bed In that dim monument where Tybalt lies."
Angry at Nurse for her advice to marry Paris: "Ancient damnation! O most wicked fiend"
Brave - prepared to risk Friar Lawrence's plan: "Give me, give me! O, tell not me of fear!"
Brave – does not fear death: "O happy dagger, This is thy sheath: there rust, and let me die."

CAPULET

Feuding with Capulet. Begins as doting father but becomes aggressive & controlling

Initially calm and easy-going: "Content thee, gentle coz. Let him alone."
Angered by Juliet's defiance: "Hang thee, young baggage! Disobedient wretch!"
Verbally attacks Nurse for defending J: "Peace, you mumbling fool!"
Juliet's death changes him: "O brother Montague, give me thy hand."

NURSE Devoted nanny to Juliet – talkative, silly well-meaning but irresponsible

Thinks the world of Juliet: "Thou wast the prettiest babe that e'er I nurs'd" / "lamb" / "ladybird"
Makes vulgar jokes about sex: "You shall bear the burden soon at night"
Wishes J to be emotionally and physically content with R: "happy days to happy nights"
Appears more devastated than J's family when J 'dies': "O woeful, woeful, woeful day…Never was seen so black a day as this."

BENVOLIO Romeo's loyal cousin, peacemaker and opposite to Tybalt

Cares for Romeo: "What sadness lengthens Romeo's hours?"
Protects Romeo after slaying of Tybalt: "Be gone, away! ... The Prince will doom thee death"
Contrasts with Tybalt's hostility: "I do but keep the peace, put up thy sword."

Spanish Knowledge Organiser
Year 9 - Spring 2

Week 1&2

- **No puedo** salir **porque tengo que** trabajar. - **I can't** go out **because I have to** work.
- En la ciudad **donde** vivo **no puedo** respirar **porque** el aire está contaminado. - In the city **where** I live **I can't** breathe **because** the air is contaminated.
- **Lo bueno es que puede** ganar lo suficiente para vivir - **The good thing is that he/she can** earn enough to live.
- **Lo malo es que tiene que** trabajar catorce horas al día - **The bad thing is that he/she has to** work 14 hours a day.

Week 3&4

- **Se debería** reciclar el papel y el vidrio - **You should** recycle paper and glass.
- **No se debería** tirar la basura al suelo - **You should not** throw rubbish on the floor.
- **Antés** en mi ciudad **no había nada** para los jóvenes - **Before** in my city **there was nothing** for young people.
- **Ahora hay muchas** cosas para los jóvenes, **por ejemplo** un polideportivo. - **Now there are lots** of things for young people, **for example** a sports centre.

Week 5&6

- **Vamos a hacer** una campaña **para** recaudar fondos - **We are going to do** a campaign **in order to** raise funds.
- **Es** muy importante no malgastar el agua. **Por eso** cierra el grifo **mientras** lavas los dientes. - **It is** very important to not waste water. **So** turn off the tap **whilst** you brush your teeth.
- **Lo más importante es** ducharse en vez de bañarse. - **The most important thing is** shower instead of having a bath.
- **Vivo** en la ciudad **pero creo que** en el futuro **voy a vivir** en el campo. - **I live** in the city **but I think that** in the future **I am going to live** in the countryside.

French Knowledge Organiser
Year 9 - Spring 2

Week 1&2

- **Pour moi** le repas britannique **est plus simple** que le repas brésilien. - **For me** British meals **are more simple than** Brazilian meals.
- En France, les enfants **mangent** du pain, des legumes et ils **boivent** de l'eau. - In France, the children **eat** bread and vegetables and **they drink** water.
- Je **ne** mange **jamais** de produits d'origine animale et je **ne** porte **jamais** de vêtements en cuir. - I never eat products of animal origin and I never wear leather clothes.
- Je **ne** mange **plus** de fruits de mer **mais** ma soeur **ne** refuse **rien**. - I **no longer** eat seafood **but** my sister **doesn't** refuse **anything**.

Week 3&4

- Le pays **le plus** écologique est la Finlande et la mer **la plus** poluée c'est la Méditerranée. - **The most** ecological country is Finland and **the most** polluted sea is the Mediterranean.
- **Il faut** consommer moins d'énergie et **il ne faut jamais** laisser des sacs en plastique sur la plage. - **We must** consume less energy and **we must never** leave plastic bags on the beach.
- **L'année dernière nous avons organisé** une campagne anti-plastique. - **Last year we organised** an anti plastic campaign.
- Au supermarché je refuse les sacs en plastique **parce que j'ai acheté** un sac un coton, **je le trouve très** pratique. - At the supermarket I refuse plastic bags **because I bought** a cotton bag, **I find it very** practical.

Week 5&6

- **Quand j'étais** petit, **je ne faisais rien pour** réduire le plastique. - **When I was** small, **I didn't used to do anything to** reduce plastic.
- **J'aimerais** manger **moins** de viande et **je voudrais** faire du travail bénévole. - **I would like** to eat **less** meat and **I would like to** do voluntary work.
- **Je pense que** le problème **le plus grand** pour les ados c'est l'environnement. - **I think that** the **biggest** problem for adolescents is the environment.
- **Je trouve que** l'environment est **vraiment** important. Le problème **le plus urgent** c'est le plastique **car il faut** proteger les animaux menacés. - **I find** the environment **really** important. **The most urgent** problem is plastic **because we must** protect endangered animals.

Year 9 Food Knowledge Organiser: Principles of Nutrition

Macronutrients
Needed in **large amounts** to help the body to function properly

Protein:

These are made up of ***essential amino–acids*** and ***non-essential amino–acids***. (Our bodies can make non-essential amino acids, but we need to get essential amino acids from our food).

Source

HBV – these have all the essential amino acids
•Meat, fish, dairy, eggs (animal sources)
•Tofu
LBV – these are missing at least one essential amino acid
•Seeds, nuts, beans, pulses, cereals, Quorn (plant sources)

Function

Growth
Repair
maintenance

Not enough	Too much
Kwashiorkor Oedema Anaemia Slow growth in children	Excess protein can be converted to energy. If unused turns to fat.

Dietary Reference Values

Age	Amount
1-3	15g
4-6	20g
7-10	28g
11-14	42g
15-18	55g
19-50	55g
50+	53g

Complementary actions

Combining 2 or more LBV proteins helps get a balance of essential amino acids.
e.g. beans on toast.

Watch this video to learn more

https://www.youtube.com/watch?v=cKRf53I737E

Fats, oils and lipids:

Too much fat is bad for you, but so is not enough.

Source

Saturated Fats
(From Animal sources. They are also called unhealthy fats. They are generally solid at room temperature)
Sausages / Bacon / Lard / Dairy

Unsaturated Fats
(These are healthier. They are often liquid at room temperature.)
Monounsaturated fats
– olive oil / avocados
Polyunsaturated fats
– sunflower oil / seeds

Omega-3. These are Polyunsaturated and called "healthy" fats as your body needs them but can't make them. They are good for your heart.
– Oily fish / Nuts / Seeds

Function

Energy
Warmth
Protection of organs
Source of fat soluble vitamins
Hormone production

Dietary Reference Values

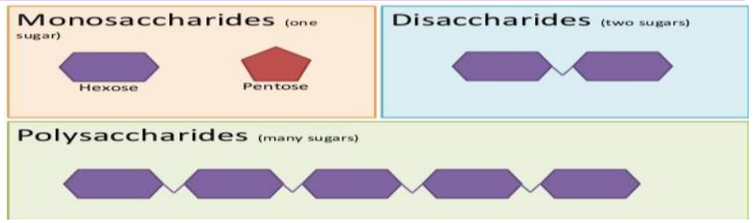
DRI	Men	Women
Total fat	95g	70g
Sat fat	30g	20g

Too much	Not enough
Obesity **Heart disease** **Type 2 diabetes** **Stroke** **Cancer**	Vitamin deficiency (fat soluble) Unprotected organs

Carbohydrates

There are 2 kinds, simple and complex -
Sugar & Starches

.



Source

Simple - these are sugars (monosaccharides, disaccharides)
Cakes, jam, soft drinks

Complex - these are starches (polysaccharides)
Bread, potatoes, Flour, Pasta,Rice.

Function

Simple
Quick burst of energy
Complex

Longer lasting energy

Free sugars

These give you no nutritional benefit other than energy.

Dietary advice

- Reduce the amount of sugar that we eat, no more than 5% of our diet.
- Complex Carbohydrates should make up half of the energy we eat.
- Wholegrain cereals are a good source of fibre

Not enough	Too much
Can make blood sugar level drop • hunger, • dizziness, • Tiredness • Lack of energy Our body will use protein for energy (leads to loss of muscle)	• Excess is turned into fat • Can cause obesity • Too much sugar leads to dental problems • Can lead to type 2 diabetes

Year 9 Food Knowledge Organiser: Dietary needs

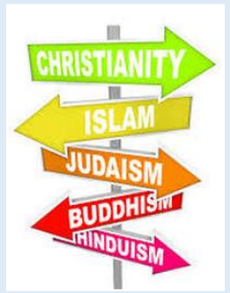
Dietary Needs

People have different dietary needs; this affects what they can and cannot eat.

Key Words:

- **Allergy:** an adverse reaction by the body to certain substances.
- **Intolerance:** a condition that makes people avoid certain food because of the effects on their body
- **Allergic reaction:** the way someone responds to certain food. For example: a rash/swelling/anaphylactic shock

Some people make a choice not to eat certain foods. Reasons include:



- Religious beliefs

- Medical reasons

- Taste/texture of food

- Ethical beliefs

Vegetarians

There are many different types of vegetarian depending on which animal foods are included in the diet.
People may follow a vegetarian diet for different reasons

- They do not like the thought of eating dead animals, fish, birds
- They think it is cruel to kill for food
- Their religion does not allow them to eat meat, fish, poultry.
- They think it is healthier to eat a vegetarian diet.

The three main types of vegetarian are lacto-vegetarian, lacto-ovo vegetarian and vegan.

lacto-vegetarian –will not eat any meat, fish or eggs, but will consume milk and dairy products.
lacto-ovo vegetarian –will not eat any meat, or fish , but will consume eggs, milk and dairy products.
Vegan – will not eat any food that is made directly or indirectly from an animal. They also refuse to use product such as soap and cosmetics which involve the use of animal oils or fats.

Diet Related Health Problems

Obesity - When the body has too much fat.

- BMI (Body Mass Index) is used to calculate body mass

BMI of 18.5 – 25 is normal, 30 + is obese.

Cause: energy in > energy out; Eating too many high energy foods (fat & sugar); Low exercise levels.

Problems: High blood pressure and cholesterol = heart problems; Increased risk of type 2 diabetes & cancer

Breathing difficulties, fatigue & low self esteem.

Coronary Heart Disease Arteries clogged with cholesterol

- Cause: saturated fats, low physical activity, smoking & high blood pressure.
- Health Problems: Blood cannot pass through arteries properly which causes heart to pump faster and harder, causing chest pains (angina);blood flow and oxygen to the heart gets blocked which causes heart attacks

Tooth Decay

Plaque is a substance which contains bacteria. This builds up from food in the mouth. Bacteria feed on sugars and form acids which eat away at tooth enamel and cause tooth decay (caries/cavities) Cause: high sugar foods.

Religious Reasons

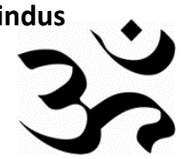
Islam

- **Do not eat pork**
- **Meat must be halal**
- **No alcohol or shellfish**

Judaism

- **No pork or shellfish**
- **No milk and meat together**
- **Meat must be kosher**

Hindus



- **No beef or beef products**
- **Mostly vegetarians**
- **No alcohol**

Medical reasons

Name of medical condition	Food/drinks to avoid	Reason to avoid
Diabetes	Starchy food/ high in sugar	High in saturated fat. Can lead to heart disease, while excess sugars can cause unwanted weight gain and blood sugar spikes
Nut allergy	Nuts, blended cooking oil, margarine with nuts oils and often seeds	the immune system overreacts to proteins in these foods
Lactose intolerance	Milk, cheese, yogurt, processed food	cannot metabolize **lactose** properly; they lack lactase, an enzyme required in the digestive system to break down **lactose**. Patients typically experience bloating, flatulence, and diarrhoea
Gluten intolerance (coeliac)	Wheat, wholemeal, bran, pasta, rye, beer	Celiac disease is caused by a reaction to a gluten protein found in wheat, barley, rye, and sometimes oats. Symptoms include chronic diarrhoea, weight loss and fatigue

YR7 GRAPHICS

The Design Process

Brief

A brief is a set of **instructions** given to a designer by a company (**client**) about a job or task they wish to be completed.

A **company** (client) will ask a **graphic designer** to create a **product**. A product means an item that can be sold to people (**consumers**).

A brief will set out clearly what it is that should be made (**constructed**) and what requirements (**specifics**) will need to be included in the **design process**.

Isometric

When the concept drawing is finished, the design will be turned into an isometric drawing where the size (**dimensions**) of the parts are finalised. Specific measurements (**metric – CM, MM**) are used so that it can copied many times (**mass produced**).

The design will be computerised (**digitally formatted**) so that it can be **saved**, **shared** and **inputted** into the machines that produce it.

Market Research

Companies will employ people to conduct **surveys**. A survey is a set of **questions** that are asked to many people. Often companies would decide which people they will ask (**target audience**). They wish know peoples **preferences** and **spending habits**.

The answers are important to the **design process** and can influence the way the product is **designed**. To make it easy to see large amounts of **data**, companies use **graphs**.

Testing Models

When isometric drawings are complete, it will go through a process of being made **3D**. A number of **machines** will be used to create practice models (**prototypes**) to see how the product works. It must be easy for a human to use (**ergonomics**). **3D printers** are often used.

If the product is made out of different **materials** such as glass, metal or wood, these would require different methods of construction (**manufacturing**).

Design Process

Designers will explore lots of ideas before selecting the right one. Often this involves creating **mind maps**, **sketches** and **mood boards**.

A mind map starts with a single word and then ***explores ideas*** around it, these are sorted into **categories**.

When drawing sketches, designers will work out how it works (**functions**). Ideas at this stage can be really ***creative*** and ***imaginative***.

A mood board is a collections of pictures, drawings, text (**typography**) and **materials** to do with the **theme**.

Packaging

When a final product has been made and passed safety standards, it will be labelled and have its own (**custom**) **packaging**.

Packing must –

- Be eye catching (**visually pleasing**) to attract customers to buy it.
- Protect the item inside it to **avoid damage** or **contamination**.
- Provide **accurate information** about the product inside.
- Stack easily for **transportation** from factory to shops.

Concept Art

Artists/**illustrators** will draw a number of different sketches of the product from different angles.

When designing, **colour** and **style** is important. It is important to think about how it looks (**aesthetics**). Designs will consider the mood board and specifics.

Drawings can be in **traditional** materials (pen, pencil, paint) or using **CAD** (Computer Aided Design) and electric drawing pads (**graphics tablets**).

Advertising

For companies to make money (**financial Income**), they must tell as many people as possible about their product.

This often happens through **social media**, **adverts**, **radio stations**, **magazines** and **displays** in shops.

Its important that the product is well received by its target audience so that people buy it and share reviews of it. Companies make a **profit** when they sell items for more than the price of making it. .

Geography
Year 9: UK resource management

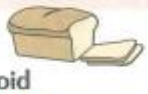
- Food in the UK
- Water in the UK
- Energy in the UK

Unequal Resource Distribution

Global supply and consumption is unequal. A country's consumption depends on:

1. RESOURCE AVAILABILITY — energy reserves, environment suited to food production.
2. WEALTH — to import resources, to produce resources using technology.

Country type	Consumption	Reason
HICs	High	Can afford resources. Higher standard of living.
NEEs	Increasing	Industry — population and wealth increasing.
LICs	Low	Can't afford to exploit or buy resources.



FOOD —
Needed to avoid undernourishment (not getting enough food) and malnourishment (not getting the right balance of nutrients).

Malnourishment can limit childre development ana increase disease risk.

Food in the UK

Demand for certain types of food is growing:

High-value foods
Often grown in LICs, e.g. Ethiopia.
E.g. exotic fruits and vegetables, spices, coffee.

Seasonal products
Out-of-season foods imported all year round.
E.g. in winter, strawberries from Mexico.

Organic produce
Increased concerns about:

- how chemicals affect health.
- how food production affects environment.

Organic food production is strictly regulated.

BUT:
Imported food → More food miles → More CO_2 released → Larger carbon footprint + More environmental awareness → Demand for locally-sourced food increases

There is a growing trend towards agribusiness:

- large-scale industrial farms.
- more chemicals used, e.g. fertilisers.
- more machinery = fewer workers needed.

CARBON FOOTPRINT (of food) — the amount of greenhouse gas released while producing and transporting food.

ENERGY —
Needed for industry, transport and home use.

Stable electricity supply = better quality of life.

No electricity → wood / kerosene used instead → deforestation / fumes.

Electricity can power pumps for wells to provide safe water.

Water in the UK

Demand is rising — more appliances and larger population.

North and west → high rainfall = water surplus
South east and the Midlands → high population density = water deficit

Birmingham (deficit) is supplied with water from Wales (surplus).

Water quality can be affected by pollution, e.g. from fertilisers, vehicles, factories.

Strategies to manage water quality include:

- improving drainage systems.
- regulating fertiliser and pesticide use.

Water can be transferred from areas of surplus to areas of deficit, but:

- building dams and aqueducts is expensive.
- it affects wildlife.
- it can cause political issues.

WATER —
Clean, safe water is needed for drinking, cooking and washing.

Sanitation prevents the pollution of water sources by raw sewage, and water-borne diseases, e.g. cholera.

Needed to produce products such as food and clothes.

Energy in the UK

In 2014, renewables generated 19% of UK electricity.

The energy mix has changed:

- decreased reliance on fossil fuels (coal, oil and gas).
- greater significance of renewables (wind, bioenergy, solar and hydroelectric power).

Aims to reduce CO_2 emissions → Decreased coal demand → Production drops

North Sea oil and gas being used up rapidly. → Extracting shale gas through fracking is being considered.

Exploiting energy resources can cause issues:

Economic issues	Environmental issues
Extracting fossil fuels is expensive — cost increases as reserves used up.	Burning fossil fuels releases CO_2 and other greenhouse gases.
Nuclear and renewable energy is more expensive for consumers.	Fracking may pollute groundwater and cause mini-earthquakes.
UK must import energy to meet demand.	Nuclear disasters and oil spills damage the environment.
Money needed for research into alternative sources.	Renewable energy generation damages ecosystems and may be an eyesore.

Year 8 Half-term 3- The World after World War II- knowledge organiser created by Mr Pritchard

What was the Cold War?

- During the Second World War, the Soviet Union, USA and Britain formed the 'Grand Alliance'. These countries had different ideologies. Britain and the USA were capitalist. The Soviet Union was Communist.
- Between 1944-5 the Soviet Union 'freed' countries in Eastern Europe from the Nazis. Stalin was reluctant to give up control of these countries because they were a useful buffer zone. He turned them into satellite states which meant they were under Soviet control.

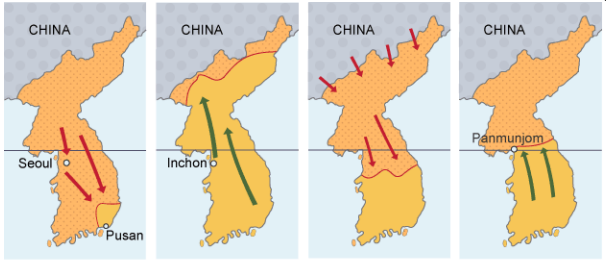
Capitalism- capitalists believe everyone should be free to own property and business and to make money.
Communism- communists believe all property should belong to the state to ensure that every member of society has a fair share.

The differences between communism and capitalism

	Soviet Union	USA & Britain
Politics	Single-party rule	Free elections with a choice of parties
Social structure	Classless society, everyone is equal	Some people have more power than others (because of family background, wealth, education or achievements)
Economy	All property owned by the state, not individuals	Private ownership and a competitive workplace
Rights	Rights of all workers more important than individual rights	Individual freedoms valued but limited by majority opinion

The Korean War

- After World War Two, Korea had been divided at the 38th parallel into the Soviet backed communist North Korea, led by **Kim Il-Sung**, and non-communist, American-backed South Korea under **Syngman Rhee**.
- In June 1950, with the support of China and the Soviet Union, North Korea launched an attack on South Korea across the 38th parallel. Kim Il-Sung planned to unify North and South Korea into one communist country.



June 1950
The North Korean People's Army advanced quickly and pushed the Southern forces to a small area around Pusan in South Korea.

July 1950
The USA sent troops to support South Korea.

October 1950
UN forces almost rolled back the Communists to the Yalu River on the border with China.

October 1950
China invaded Korea and drove UN forces below the 38th parallel.

June 1951
The Communists were driven back to the 38th parallel.

July 1953
An armistice was signed at Panmunjom on the 38th parallel, which left Korea divided.

Berlin 1958-63

- ***The refugee problem in Berlin, 1958-*** In 1949- Germany divided into two. W. Germany received Marshall Aid and became prosperous. E. Germany received less aid from Soviet Union, suffered from low living standards and shortages. 3 million East Germans moved to West Germany by 1958- choosing capitalism over communism.
- ***The Berlin Ultimatum, 27 November* 1958-** Demanded Berlin be demilitarised, Western troops withdrawn and that Berlin become a free city. Khrushchev saw his demands as essential action to stop the flood of skilled citizens leaving E. Germany.
- ***Summit meetings 1959-61-*** there were 4 meetings to solve the 'Berlin problem'. But no formal agreement was ever made.
- ***Building the Berlin Wall-*** On night of 12 August 1961, East German troops built a barbed wire fence around Belin and between East and West Berlin, followed up by building a concrete wall. It solved problem of division of Berlin. Refugees were unable to leave East Germany; USSR avoided war with USA; Communism survived in East Berlin.

The Cuban Missile Crisis

- ***The Cuban Revolution-*** January 1959, revolutionaries toppled the pro-American government of Cuba.
- ***The Bay of Pigs incident-*** 17 April 1961 a group of Cuban exiles, trained by the CIA, invaded at the 'Bay of Pigs' in Cuba to try to topple Castro's regime but it was a complete failure.
- 14 October 1962 an American US spy plane took pictures of launch pads for medium range ballistic missiles on Cuba. Kennedy felt this had to be stopped.
- The **Thirteen Days,** 16-28 October 1962, were tense. President Kennedy called an Executive Committee to discuss what to do. A naval blockade was decided. The US public were informed of the missiles on Cuba.
- 24 October, Soviet ships reached the blockade and then turned around- the Soviets had avoided conflict.
- A sequence of telegrams between the USA and Soviet Union reached a deal to remove the missiles from Cuba: a secret part of the deal said the USA would remove their missile from Turkey.

Czechoslovakia, 1968-9

Czechoslovakia was ruled by the Soviet Union and the economy was run for the benefit of the Soviet Union.

The Prague Spring

- 1968 Alexander Dubcek was elected as First Secretary of the Czech Communist Party (head of government).
- Dubcek believed in communism but wanted to offer socialism with a 'human face' and introduced a series of reforms known as the 'Prague Spring' which included a relaxation of censorship, more power to trade unions and regional governments, freedom to travel and increased trade with the west.

The Soviet Reaction

- 20 August 1968 500,000 Warsaw Pact troops invaded Czechoslovakia and ended the Prague Spring.
- **The Brezhnev Doctrine** was issued on 26 September- it said the actions of any individual communist country affected all communist countries and all should take steps to stop such actions. In effect it prevented all communist countries from introducing reforms.

Year 9 History Knowledge organiser Half-term 4: Vietnam

Why did the USA get involved in Vietnam?

- Vietnam had been a French colony before World War II but the Vietnamese wanted independence.
- 13 March 1954 a battle began between Vietnamese and French troops at Dien Bien Phu. The French lost. 9 countries met in Geneva to decide what would happen to Vietnam- it led to the division of Vietnam.
- Under Eisenhower, the USA committed advisors and aid to South Vietnam, due to fear of communism and the domino theory (the idea that if Vietnam became communist other countries would follow).
- Johnson became President after the assassination of Kennedy in 1963. The situation that Johnson inherited was significantly worse because the Vietcong had become even stronger by 1964.

The Gulf of Tonkin incident, 1964

President Johnson claimed that 2 US Navy vessels were fired upon by North Vietnamese boats. Congress passed the Gulf of Tonkin Resolution. This gave the president the right to send US troops to fight in Vietnam and increase air support for the South Vietnamese Army. In retaliation, North Vietnam sent more supplies to the Vietcong in South Vietnam and the war expanded considerably.

Vietcong guerrilla tactics

- The Vietcong fought a guerrilla war. Anyone could be a VC member. The Vietcong used a complex system of tunnels that contained hospitals, weapon and fuel storage areas and living space.

US tactics

- ***Operation Rolling Thunder (2 March 1965- end 1968)*** **-** A bombing campaign over North Vietnam. Targets included Ho Chi Minh Trail and industry in the North.
- ***Search and destroy-*** small units of US soldiers searching for the VC and then calling up helicopters to bomb or spray chemicals on them.
- ***Chemical warfare-*** A variety of herbicides were used to kill jungle plants and crops in the farmland around villages. This was to make VC bases easier to find and to stop villagers feeding the VC.

The My Lai Massacre, 1968

- 16 March US troops from Charlie Company were sent to the village of My Lai and were told to expect to come under fire from the VC. They didn't: there were only women, children and old men there. But the troops led, by Lt Calley, killed all the people and animals- they said they had been ordered to do so.
- After the massacre the US military announced the mission had successfully destroyed a VC base and killed 128 VC. The army organised a cover-up.
- One soldier collected eye-witness evidence and in 1970 there was a new enquiry. 35 newspapers reported the massacre. Lt Calley was charged with murder (but nobody else).

The Kent State shootings, May 1970

- Protests by university students on the Kent State University campus spiralled out of control. The National Guard was called in and protests were banned but many ignored the ban.
- 4 May- 4 unarmed students shot by Ohio National guardsmen during a protest against the war.

Opposition to the war

- *The student movement*- Many students wanted social change. Protest methods included sit-ins, boycotts, demonstrations, marches, refusing to go to class, going on striking and burning their draft cards.
- *The draft (compulsory military service)*- Men were drafted from the age of 18. It increased opposition to the war because many thought it was unfair. Anti-war activists gave advice on how to avoid the draft and even tried to persuade those who had been drafted to avoid it. 15 million avoided being drafted.
- *How the media showed the war*- It was the first war to be widely watched on television. Reporters regularly travelled with troops into the warzone uncensored. Many Americans saw war footage and news of anti-war protests. People lost faith in the government.

The Tet Offensive

A series of attacks on 26 cities and US bases in S Vietnam. It began on Tet Lunar New Year- one of the Vietnam's most important holidays. The attacks began successfully and included taking over the US embassy, Presidential Palace, ARVN headquarters, radio station and airport. These were recaptured quickly and the VC were almost wiped out BUT the US didn't know this and it was seen as a humiliating defeat for the US.

Changes under Nixon

President Nixon promised to get the USA out of the war. **Vietnamisation** was how Nixon planned to do this.

- US troops to be withdrawn 'with honour'- not leaving the South at the mercy of the North and VC.
- ARVN to provide its own officers- but the US would still provide training and equipment
- There were official peace talks (representatives of North and South Vietnam and the Vietcong) and secret peace talks with N. Vietnam only.
- It also involved expanding the war by secretly bombing the countries of Cambodia and Laos (which bordered on Vietnam) to stop supplies reaching South Vietnam AND the bombing of North Vietnam.

The Paris Peace Conference

Peace talks began in Paris in 1968 but it took until 1973 to reach an agreement. Signed by the USA, North Vietnam, South Vietnam and the Provisional Revolutionary Government. They agreed:

- All counties to accept Vietnam as a single country with a ceasefire to lead to reunification by agreement
- No US interference and withdraw within 60 days
- USA to give aid for reconstruction of N and S Vietnam

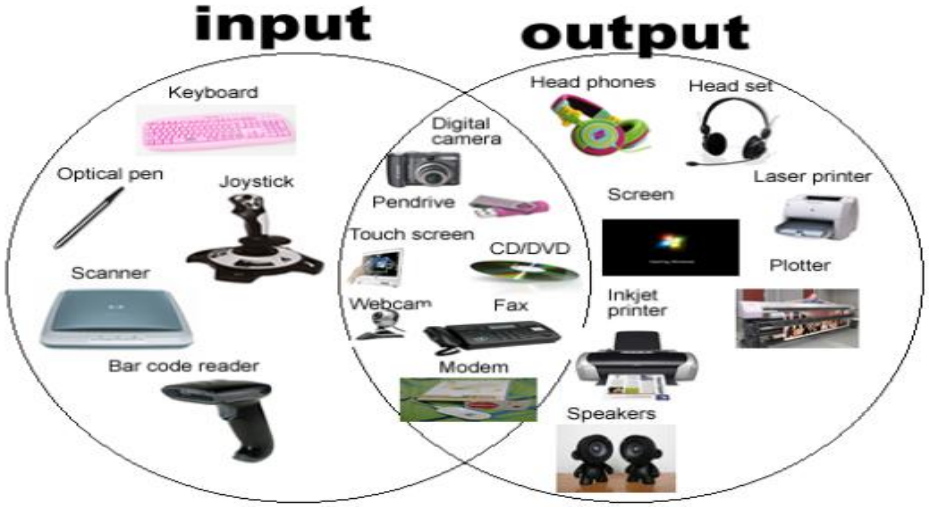
The Peace Accords were significant for several reasons:

- The South Vietnamese economy collapsed and the government was corrupt and would not work with the communists in the North or South.
- The North Vietnamese were determined to achieve a united, communist Vietnam. A new attack in December 1974 led to the fall of Saigon the following year- and a united Vietnam.

Year 9 Knowledge Organiser ICT – Functional Skills

Email Key words

Communication – The sharing or exchanging of information by speaking, writing, or using some other medium such as email.
Email – Messages sent by electronic means from one device to one or more people.
Compose – To write or create something.
Send – To make an email be delivered to the email address it is addressed to.
Attachment – A file, which could be a piece of work or a picture that is sent with the email.
Address book – A list of people who you regularly send an email to.
Save to draft – Allows you to save an email that you are working on and send it later.
Password – A secret word, phrase or combination of letters, numbers and symbols that must be used to gain admission to a site or application such as email.
CC – A way of sending a copy of your email to other people so they can see the information in it.
Formatting – Allows you to change the way the text of an email looks. For example, you can make the text bold or underline it.

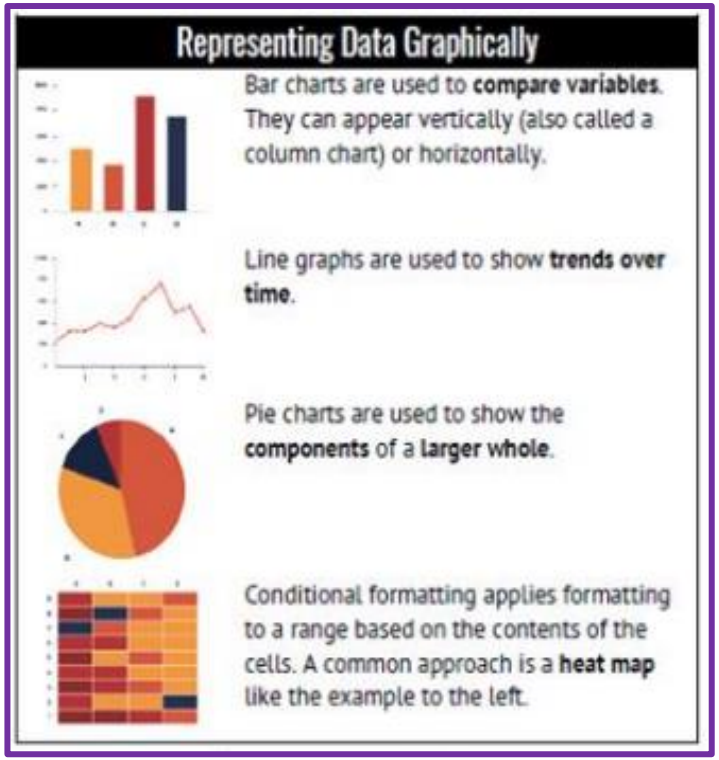


Using the internet safely

Malware - malicious - software intended to cause harm.
Penetration Testing - Organisations employ professionals to try and hack their network so that they can find areas of weakness.
User Access Levels - Different employees have different levels of access to programs, websites and data.
Encryption - data is scrambled so that it cannot be understood if intercepted. It can only be decrypted with a key.
Types of Malware Virus - attach themselves to files and copy themselves when the user copies or opens a file.
Worm - copy themselves without the user doing anything.
Trojan - malicious software pretending to be a legitimate program
Copyright – protects written, music, video, software and images being used without permission.

Cloud Storage

Examples are Microsoft One Drive or Google Drive
Stores files online enabling files to be accessed on any device with internet access.
Share files with others and automatic backup



Features of a strong password

A mix of letters, capitals, symbols, numbers
8 or more characters

No dictionary words
No personal information
Consider replacing letters with numbers e.g. the letter E and 3

Year 9 Knowledge Organiser ICT – Functional Skills

Microsoft Office	Word	Excel	PowerPoint	Outlook	Microsoft Teams
Type of program	Word processor	Spreadsheet	Presentation	Email	Chat-based collaboration
Description	Used mainly for creating documents such as letters, brochures, learning activities, tests, quizzes and students' homework assignments. Make changes easily, such as correcting spelling, adding, deleting, formatting and relocating text. Document can be printed quickly and accurately saved for later modifications.	Used to create spreadsheets, which are documents in which data is laid out in rows and columns — like a big table. Helpful and powerful program for data analysis and documentation. Store, organize and manipulate data by creating spreadsheets. Data can be manipulated mathematically using arithmetic operations and functions. Typically used to organize data and perform financial analysis.	Used to create dynamic, informational slides through the use of text, graphics, and animation. Visually display information, using anything from basic slideshows to professional multimedia presentations. Combine text, graphics and multi-media content.	Used mainly to send and receive emails. It can also be used to manage various types of personal data including calendar appointments and similar entries, tasks, contacts, and notes.	Provides a modern conversation experience for today's teams. The core capabilities include business messaging, calling, video meetings and file sharing.
Features	Create documents with different font, styles, sizes, colours. Spelling and grammar check, Thesaurus, Translate, Language preference Insert tables, images, shapes, charts	Use of formulas e.g. sum or average on a large amount of data all at once. Analyse data to discover trends. Graphs and charts can summarize the data and store it in an organized way. Tools for sorting, filtering and searching.	Add text, images, art, and videos. Select a professional design with PowerPoint Designer. Add transitions, animations, and motion.	Send, receive and organise mail. Save and edit contacts lists. Create and manage tasks and alerts. Send and receive meeting invitations. View and manage your calendar.	Conversations within channels and teams. A chat function between teams, groups, or individuals. Document storage and sharing. Online video calling and screen sharing.

Word Processing Key Words

Alignment – the orientation of the lines of a paragraph with respect to the margins.
Editing – making modifications to an existing document.
Font Style– adds emphasis to a font: bold, italic and underline.
Bullet – A dot or symbol that marks an important line of information or designates items in a list.
Vertical Alignment – The position of text in relation to the top and bottom page margins.
Horizontal Alignment – The position of text in relation to the left and right page margins
Autocorrect – A word feature that automatically corrects common spelling errors as you type.
Editing – making modifications to an existing document.
Menu Bar - The menu bar typically appears at the top of the word processing application's window and contains a listing of the main commands in the form of text

Spreadsheet Keywords

Active Cell - The active cell is the cell in the spreadsheet that is currently selected for data entry.
Cell - A cell is a rectangular area formed by the intersection of a column and a row.
Data - Data refers to the type of information that can be stored in the cells of a spreadsheet.
Formula - A formula is a spreadsheet data type that will calculate a result and display it in the active cell.
Labels - Labels refer to text that is typed into the cells of a spreadsheet.
Range - A range is a group of cells in a spreadsheet that have been selected.
Rows - Rows run horizontally on the spreadsheet screen.
Workbook - A workbook is a collection of worksheets that are saved together in one file.
Column - Columns run vertically on the spreadsheet screen.
Column / Bar Chart: A column or bar chart is a style of chart that is used to summarize and compare categorical data.

B2: Cells and control

Lesson sequence

1. Mitosis
2. Animal growth
3. Plant growth
4. Stem cells
5. Nervous system
6. Neurotransmission
7. Controlling movement

1. Mitosis	
***Cell cycle**	The life of a cell comprising interphase and mitosis.
***Interphase**	Preparation for mitosis in which extra cell parts are made and DNA chromosomes are replicated (copied).
***Mitosis**	When one cell divides into two genetically identical daughter cells.
***(I)PMATC**	The stages of mitosis: interphase (not mitosis), prophase, metaphase, anaphase, telophase, cytokinesis.
****Prophase**	The membrane of the nucleus breaks down and spindle fibres start to form.
****Metaphase**	Spindle fibres fully form and chromosomes line up across the middle of the cell.
****Anaphase**	Chromosome copies separate and move to each end of the cell.
****Telophase**	A new membrane forms around each set of chromosomes to form two nuclei.
****Cytokinesis**	The two new cells fully separate.
***Cancer**	When mitosis happens out of control forming large lumps of cells called tumours.

2. Animal growth	
***Growth**	Increase in size due to increased numbers of cells.
***Percentile**	A measure of the growth of a child that compares them to other children of the same age.
***90th percentile**	A child is taller than 90% of children of the same age.
***50th percentile**	Average for height/mass for the age.
***Percentile graphs**	Graphs showing how height/mass change with age with different lines for each percentile.
***Cell differentiation**	When a cell divides by mitosis to produce two different types of cell (not two identical ones).
***Specialised cell**	A cell special features designed for a specific job.
****Importance of differentiation in animals**	To produce all the different types of cell the body needs such as red blood cells, fat cells, nerve cells and muscle cells.

3. Plant growth	
***Plant growth**	Cell division creates more cells, elongation makes these cells get bigger.
****Meristems**	Areas just behind the tips of roots and shoots where cell division and differentiation happens.
****Importance of differentiation in plants**	To produce all the different types of cell a plant needs such as root hair cells and xylem cells.
****Calculating percentage changes**	% change = (final value – starting value) / starting value x 100

4. Stem cells	
***Stem cell**	A cell that can differentiate when it divides, to produce two different cells.
****Embryonic stem cell**	A stem cell that can become any kind of cell. Found in developing embryos.
****Adult stem cell**	A stem cell that can only become a few types of cell. Found in animals after birth.
***Stem cells in medicine**	It is hoped they can be used to replace damaged cells in diseases like type 1 diabetes or leukaemia, or to grow new organs for transplant.
****Problems with stem cells**	They may potentially cause cancer, stem cells can only be used in the person they have come from.

5. Nervous system	
***Nervous system**	All the nerves in your body working together to gather information, make decisions and control responses.
***Central nervous system**	The brain and spinal cord – makes decisions (aka CNS).
****Peripheral nervous system**	All your other nerves – gathers information from your sense and carries messages from the CNS to your muscles.
***Neurone**	A nerve cell
***Impulse**	Electrical message carried by a neuron.
****Cell body**	The central part of a nerve cell containing its nucleus.
****Dendron and axon**	The long parts of a nerve cell carrying impulses towards the cell body (dendron) and away from it (axon)
****Myelin sheath**	A fatty layer around the axon and dendron that insulates it to prevent the impulse from escaping and speeds the impulse up.

6. Neurotransmission	
** **Neurotransmission**	The travelling of an impulse along a neuron and into another.
****Dendrites**	Branches at the beginning of a dendron that connect to receptor cells or another neuron.
****Axon terminals**	Branches at the end of an axon that connect to a muscle or another neuron.
****Synapse**	Small gap between two neurons where the axon terminals of one meet the dendrites of another.
** **Neurotransmitter**	Chemicals released by axon terminals that diffuse across the synapse to trigger a new impulse the dendrite of another neuron.
****Sensory neuron**	Nerve cell that carries impulses from sense organs to the CNS. Has a long dendron and a long axon.
****Relay neuron**	Nerve cell in the CNS that makes decisions. Dendrites join onto cell body, short axon.
****Motor neuron**	Nerve cell that carries impulses from the CNS to muscles. Dendrites join onto cell body, long axon.

7. Controlling movement	
***Stimulus**	A piece of information detected by the nervous system.
***Receptor**	Cells that detect a stimulus.
***Response**	The action that the nervous system makes happen.
***Effector**	The body part that produces the response, often a muscle.
****Voluntary movement**	A stimulus is detected by a receptor, causing an impulse to be carried by a sensory neuron to the brain. Relay neurones in the brain decide what to do and send another impulse down a motor neuron to the effector (muscle) to cause a response.
***Reflexes**	Automatic responses that happen very quickly without conscious thought to keep the body safe.
****Reflex arc**	Movement is caused in the same way as for voluntary movement, except the spinal cord makes the decision without needing the brain to think.

C3 & 4: Atoms and the periodic table

Lesson sequence

1. Structure of atoms
2. Detailed structure of atoms
3. Isotopes
4. Mendeleev's periodic table
5. The modern periodic table
6. Electron configuration

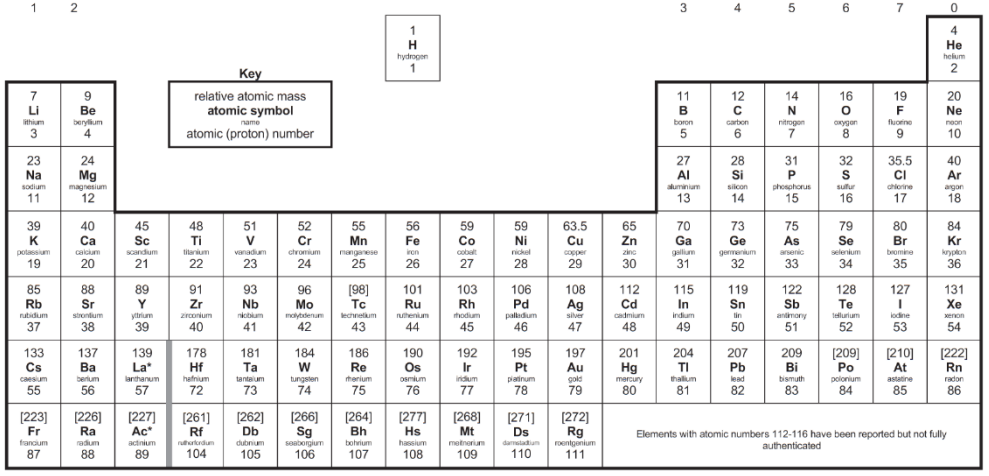
1. Structure of atoms	
***Particle**	The tiny pieces that all matter is made from.
***Atom**	The smallest independent particle. Everything is made of atoms.
****Size of atoms**	About 1 x 10^{-10} m in diameter.
****Dalton's model of atoms**	- Tiny hard spheres - Can't be broken down - Can't be created or destroyed - Atoms of an element are identical - Different elements have different atoms
***Subatomic particles**	Smaller particles that atoms are made from.
***Proton**	Mass = 1 Charge = +1 Location = nucleus
***Neutron**	Mass = 1 Charge = 0 Location = nucleus
***Electron**	Mass = 1/1835 (negligible) Charge = -1 Location = shells orbiting nucleus
***Nucleus**	Central part of an atom, 100,000 times smaller than the overall atom

2. Detailed structure of atoms	
****Alpha particle**	Small positively charged particle made of two protons and two neutrons.
****Scattering**	When particles bounce back or change direction.
****Rutherford's experiment**	Fired alpha particles at gold leaf, used a phosphor-coated screen to track where they went.
****Rutherford's results**	Most alpha particles went through, some scattered (changed direction).
****Rutherford's explanation**	Scattered particles hit a solid nucleus. Most did not hit it, therefore nucleus is small
***Atomic number**	The bottom number on the periodic table, gives the number of protons and electrons.
***Atomic mass**	The top number on the periodic table, gives the total protons and neutrons together.
***Number of protons**	The atomic number.
***Number of electrons**	The atomic number.
***Number of neutrons**	Atomic mass minus atomic number.
***Number of protons and electrons**	Equal, because each negative electron is attracted to a positive proton in the nucleus.

3. Isotopes	
****Isotopes**	Atoms with the same number of protons but different number of neutrons.
****Describing isotopes**	Mass after the name (e.g. boron-10) or superscript mass before the symbol (^{10}B).
***Nuclear fission**	Large unstable atoms break into two smaller stable ones.
****Uses of fission**	Nuclear power, nuclear weapons.
****Relative atomic mass, A_r**	The weighted average of the masses of all of the isotopes of an element.
*****Isotopic abundance**	The percentage of an element that is made of a particular isotope.
*****Calculating A_r**	- Multiply each mass by the decimal % - Add these up **Note:** (decimal % = %/100)

4. Mendeleev's periodic table	
***Dmitri Mendeleev**	Russian chemist, developed the periodic table.
***Mendeleev's periodic table**	Ordered by increasing A_r, some elements switched according to their properties.
***Chemical properties**	Includes reaction with acid and formula of oxide.
***Physical properties**	Includes melting point and density.
****Gaps in Mendeleev's periodic table**	Mendeleev left gaps where no known element fitted and predicted these would be filled with newly discovered elements.
****Eka-aluminium**	An element that Mendeleev thought would fill a gap. He predicted its properties, which matched gallium when discovered.

5. The modern periodic table	
***Noble gases**	Gases that do not react: He, Ne, Ar, Kr.
****Moseley's experiment**	Fired electrons at samples of elements and measured X-rays produced.
****Moseley's results**	Energy of x-rays produced proportional to the positive charge of the element.
****Conc. from Moseley's work**	The atomic number must be the number of protons in the atoms.



****Pair reversals**	Elements (like Ar and K) that are not in order of increasing mass.
****Explaining pair reversals**	It means elements should be order elements by increasing atomic number instead.

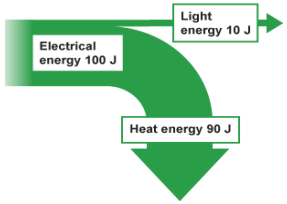
6. Electron configuration	
***Shells**	Electrons orbit atoms in shells.
***First shell**	Holds up to two electrons.
***Second shell**	Holds up to eight electrons.
***Third shell**	Holds up to eight electrons.
***Number of electrons**	Given by the atomic number.
***Filling shells**	Fill shells from the first shell out. Move up a shell when current one is full.
***Electron configuration**	The number of electrons in each shell (e.g. Al is 2.8.3).
***Outer shell**	The last shell with any electrons in it.
****Groups**	Columns in the periodic table, tell you the number of electrons in the outer shell.
****Periods**	Rows in the periodic table, tell you the number of electron shells.

P3: Energy

Lesson sequence

1. Storing and transferring energy
2. Energy efficiency
3. Insulation
4. Stored energy
5. Non-renewable energy resources
6. Renewable energy resources

1. Storing and transferring energy	
*Energy	The capacity to do work.
*Joules	The units of energy, symbol = J.
*Kilojoules	1000 J, symbol = kJ.
*Thermal energy	Energy stored on hot objects.
*Kinetic energy	Energy stored in moving objects.
*Chemical energy	Energy stored in chemicals such as fuels.
*Nuclear energy	Aka atomic energy. Energy stored in the nucleus of atoms.
**Gravitational potential energy	Energy stored in objects based on how high they are.
**Elastic potential energy	Aka strain energy. Energy stored in bent or stretched objects.
**Other forms of energy	Light, sound, electrical.
**First law of thermodynamics	Energy cannot be created or destroyed, just transferred from one form to another.
**Energy transfers	Say what form the energy starts as *and* what it becomes.



**Sankey diagram	Shows energy transfers. The thickness of the arrow relates to the amount of energy.

2. Energy efficiency	
**Dissipation	The way energy spreads out, becoming less useful as it does.
*Wasted energy	Energy that is transferred into forms that can't be used.
*Friction	Causes energy loss as heat when two surfaces rub together.
**Lubrication	Allows surfaces to move smoothly, reduces energy loss from friction.
**Electrical resistance	Causes wires to heat up, wasting electrical energy.
*Calculating efficiency	$Efficiency = \frac{useful\ energy\ transferred}{total\ energy\ transferred}$
**Energy efficiency numbers	Efficiency is between 0 and 1. 1 = no energy wasted, 0 = all energy wasted.

3. Insulation	
*Convection	Heat transfer caused when hot fluids (gas or liquid) rise because they are less dense.
*Conduction	Heat transfer through solids caused by vibrating particles bumping into each other.
*Radiation	Heat transfer by infrared radiation which heats objects up when they absorb it.
**Insulation	Materials that contain lots of tiny air pockets that prevent heat loss by conduction.
**Thermal conductivity	A measure of how well a material conducts heat.
**Draught-proofing	Sealing gaps around doors and windows to prevent heat loss by convection.

4. Stored energy	
*Calculating kinetic energy	$KE = \frac{1}{2}mv^2$
	Where 'KE' is kinetic energy in J, 'm' is mass in kg, 'v' is velocity in m/s.
**Calculating v from KE	$v = \sqrt{\frac{2KE}{m}}$
**Gravitational field strength	The strength of gravity. Different on different planets. On earth: 10 N/kg.
**Calculating gravitational potential energy	$GPE = mgh$ Where 'GPE' is gravitational potential energy in J, 'm' is mass in kg, 'g' is gravitational field strength in N/kg, 'h' is height change in m.

5. Non-renewable energy resources	
*Fossil fuels	Coal, oil, natural gas. All are non-renewable.
*Non-renewable resource	A resource that will one day run out because it is being used faster than it is being made.
**Harm from burning fossil fuels	Carbon dioxide gas is released which causes global warming. Sulfur dioxide is released which causes acid rain.
*Renewable resource	A resource will not run out.
*Nuclear power	Electricity generated from nuclear fuels such as uranium.
**Nuclear power pros and cons	☐ Lasts a long time, releases no carbon dioxide ☹Produces very harmful waste, expensive to decommission, although rare, accidents are very dangerous.

6. Renewable energy resources	
*Wind power	Large turbines spun by the wind. ☐No CO_2 ☹Lots needed, ugly?, no wind no power
*Solar power	Solar cells turn sunlight to electricity. ☐No CO_2
	☹No sun no power, need lots of space, not suitable for all countries
**Tidal power	Uses water movement from tides to spin turbines
**Tidal barrage	A damn built across an estuary that fills up when tide goes in. ☐Huge amounts of energy, no CO_2 ☹Destroys important mudflat habitats
**Hydroelectricity	A damn is built across a river valley, water released from the damn spins turbines. ☐Lots of energy, no CO_2 ☹Destroys habitat by flooding
*Biofuels	Fuels made from recently plant or animal matter, often waste. ☐Carbon neutral ☹Needs a lot of land, increases food prices
**Carbon neutral	When burning a fuel releases the same CO_2 it absorbed when it was growing, so there is no CO_2 increase.

KS3 PE THEORY KNOWLEDGE ORGANISER

Nutrition

Carbohydrate – The main and preferred source of energy for all types of activity. Required for High-Low intensity energy. Provided in bread, potatoes and sugary foods.

Fats – Used for low intensity energy. Comes in two forms; saturated fats (unhealthy) and unsaturated fats (healthy).

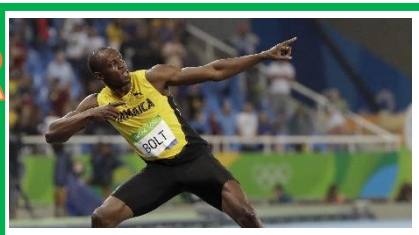
Protein – Required for tissue growth and repair and for a small amount of energy. Provided by meat, fish, eggs and dairy.

Minerals – Required for bone growth and maintenance of a healthy body. Found in vegetables, dairy and more

Vitamins – Required for health, energy and maintaining normal body functions. Found in vegetables and fruit.

Fibre – Required to reduce cholesterol and helps the digestive system (preventing constipation)

Energy Systems



Anaerobic – Exercise without the presence of oxygen. Short distance/time and high intensity – 100m – Usain Bolt

Aerobic – Exercise in the presence of Oxygen. Long distance and low intensity – Marathon Runner – Mo Farah

Types of Training

Continuous Training – Long distance steady state exercise – good for distance athletes

Fartlek Training – Altering the speed (Walk, Jog, Run, Sprint) – Good for games players

Interval Training – Periods of work and rest. (HIIT). Good for sports with rest periods

Weight Training – Lifting a resistance to increase muscle strength – Good for all athletes.

Plyometrics – Jumping, Bounding and Hopping to build power – Good for jumping athletes.

Circuit Training – Organisation of different exercises into a circuit – Good for all athletes as can be made specific.

Static Stretching – Isometric stretching to increase the flexibility of muscles – Helps prevent injury in all sports.

Types of Bones

Long Bones – Used for movement and blood cell production – Femur

Flat Bones – Strong, flat plates of bone used for protection – Ribs

Short Bones – Wide as they are long. Used for support – tarsals

Sesamoid Bones – Bone found in a tendon to allow smooth movement – Patella

Irregular Bones –

These simply do not fall into another category – Vertebrae