



Working together to  
turn your child's  
potential into reality.

# Year 9 AUTUMN Knowledge Organisers

Name:

Tutor Group: 9

# Homework Principles 2023-2024

Our Homework Principles are based on current, influential research:

At John Willmott School we set homework which supports students' understanding of their carefully sequenced curriculum as well as developing their committed and self-disciplined approach to their own academic studies. We know that homework has an impact by enabling pupils to undertake independent learning to practice and consolidate skills, learn key vocabulary, prepare for lessons, or revise for exams.

The Education Endowment Fund suggests that setting homework at Secondary School can accelerate learning by up to 5 months, however it is the quality of tasks set rather than quantity which enhances progress, which is why we are clear in our principles when planning homework against our curriculum implementation.

## ACCESSIBLE

- A new Knowledge Organiser will be issued to all students at the start of each term. This will form the basis for most homework so that students have the resources at hand
- Homework tasks should be short and focused ensuring accessibility for all students
- Students will be set homework weekly for most subjects with adequate time for completion
- Students will be taught independent learning strategies as well as explicit teaching of our virtues and school routines to build learning habits

## ACCESSIBLE

## PRECISE

- Tasks have a defined and exact outcome
- Students will be directed to practise or retrieval or embedding the curriculum
- The way this will be assessed is communicated to students, as well as when this will happen
- Homework is designed to link to classroom learning, with clear signposting to prior, current or future knowledge
- Teachers are asked to plan homework tasks for the term in line with long term plans and summative assessments- this will be shared with students and parents

## PRECISE

## INFORMATIVE

- Teachers use homework as part of their formative assessment to adapt teaching to better respond to student need in terms of what students know and what they don't know yet
- Teachers will gather data through a variety of quality first teaching routine techniques which may include: Do Now Activities, Exit Tickets, Deliberate Practice; Questioning, Mini Whiteboards
- Student engagement is monitored as well as progress and attainment

## INFORMATIVE

**JWS**

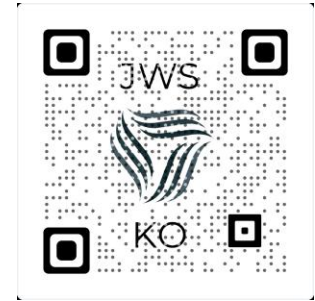
**Year 9**

**Knowledge Organisers**

**Contents**

Digital Copies of all Knowledge Organisers can be found on our school's website: [jws.bham.sch.uk](http://jws.bham.sch.uk)

In addition, you can scan the QR code on this page for a virtual e-book.



## Year 9 Subjects

Art and Design  
Drama  
English  
Food  
Geography  
History  
Information Technology

Modern Foreign Languages  
Music  
Physical Education  
Religious Education  
Science  
Design & Technology

# Art & Design: Architecture

## 1. Architecture and the formal elements

Architecture is a word that describes the practice of designing and constructing buildings.

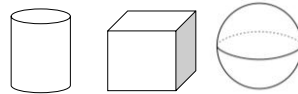
The **formal elements** are the key ingredients when creating any piece of artwork. They are known as **line, tone, texture, shape, form, pattern, space** and **colour**.

## 2. Tone and Form

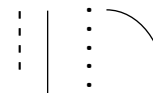
**Tone:** the lightness or darkness of a colour. This can be used to show shadows and highlights.



**Form:** a three dimensional object.



**Line:** a mark or stroke, such as dashed, dotted, straight, curved etc.



## 3. WOW WORDS

- Architect
- Design
- Material
- Style
- Decoration
- Tools
- Building
- Visual
- Three dimensional
- Exterior
- Blueprint
- Modern
- Perspective
- Urban
- Industrial

## 4. Two point perspective

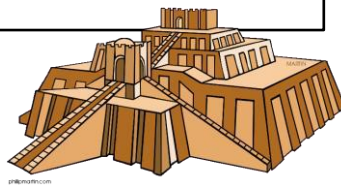
Why Two point perspective?  
Two-point perspective drawings are used in many different careers. Interior designers use them to show potential clients their ideas for decorations and renovations. Architects use them to show clients potential city plans. Creating your own drawing allows you the freedom to create your own cityscape.



## 6. Architects and architectural movements

Ziggurats  
Denys Lasdun  
Frank Gehry  
Zaha Hadid

Ancient  
Brutalist  
Deconstructivism  
Modernist



## 5. Maquette/Model

A maquette is model for a larger piece of sculpture (or in architecture a scale model), created in order to visualise how it might look and to work out approaches and materials for how it might be made.





## KNOW IT

Architecture is a word that describes the practice of designing and constructing buildings.

Tone is the lightness or darkness of a colour. This can be used to show shadows and highlights.

Shape is the area an object takes up.

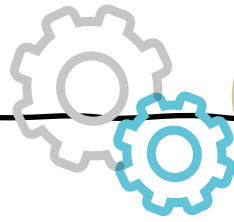
Form is a three dimensional object.

Two point perspective drawing is a type of linear perspective. Linear perspective is a method using lines to create the illusion of space on a 2D surface.

The Ziggurats built stepped pyramid structures that had between 2 and 7 levels.

Denys Lasdun designed and created a Brutalist style of Architecture.

Frank Gehry and Zaha Hadid created modernist styles of architecture. The materials often featured in their designs were concrete and metal such as titanium or steel.



## THINK IT

How many examples of architecture can you name?

Can you name how to shade from dark to light to create tonal contrast and make a drawing three dimensional?

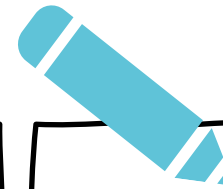
Two point perspective is a method that is used to create the illusion of space in a drawing and to create depth.

Why did the Ziggurats build pyramidal structures? What was the significance of these structures?

What did Brutalist architecture reject in its design? Can you name examples of Brutalist architecture?

What type of materials are used in Modernist architecture? Write 5 words that describe modernist architecture and explain each word.

Name 5 examples of Modernist architecture and explain why they are part of this architectural movement.



## GRASP IT

Draw an example of an architectural style working from secondary observation (a photograph of a building) that you like the style of.

Draw an iconic architectural landmark from your local area (e.g Selfridges in Birmingham). Practice drawing outlines first and then add detail and tone to create a 3D drawing.

Using 2 point perspective design and create your own cityscape. Use pencil or pen and add marks to show tone.

Find an example of an art work that uses two point perspective.

From real life or a photograph draw a building that shows consideration of perspective. Then add mark making to show tone and detail. You can use one or more types of mark making.

Design your own building considering form and function and concept and purpose.

# Drama: DNA

## 1. Emotion Memory

Emotion memory is where we take emotions, memories and feelings from our real life and try to apply them to our characters or performance.

An easy example is how many people (without even knowing the phrase emotion memory) can make themselves cry, by remembering a time where they felt sad or how their body reacted.

You can try this yourself, but be careful and avoid using overly upsetting or dramatic emotions, there are lots of actors who use this method in a system called "Method Acting" and it has been known to cause real distress to some actors.

## 4. Proxemics

Proxemics is the use of distance and levels to show distance. Although not always true, these distances can show us things.

People we love, they can be very close.

People we like can be quite close.

People we know will be closer than strangers.

Those we dislike we keep at a distance

Those we really hate, we might get close to!

## 2. Powerful characters

A powerful character in a scene would normally...

- Stand out – Not do the same as everyone else
- Have the attention of other characters
- Not move that much
- Not have to talk a lot or too loudly
- Use calm and slow movements and gestures.
- Talk slowly, with pauses respected by others

## 5. Guilt & Pressure

This play talks a lot about the power of guilt and peer pressure, using emotion memory, use the list below to try to think about how these things can physically impact us.

*Example: A high level of guilt and anxiety might change your eating or sleeping habits.*

- |                        |                    |
|------------------------|--------------------|
| 1) Posture?            | 8) Tone?           |
| 2) Gesture?            | 9) Proxemics?      |
| 3) Facial Expressions? | 10) Relationships? |
| 4) Movements?          | 11) Other habits?  |
| 5) Volume?             | 12) School?        |
| 6) Pitch?              |                    |
| 7) Pauses?             |                    |

## 3. Key words & phrases

Mime  
 Gesture  
 Facial Expression  
 Posture  
 Movement  
 Monologue  
 Duologue  
 Emotion Memory  
 Improvisation

## 6. Horrible plan

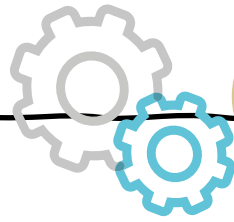
DNA is a play about teenagers who do something terrible... And need to cover it up. To help understand their characters you can use "What if?" which is an improvisation technique where you ask yourself questions which put you in the characters shoes.

"How would you get away with it? What would the risks be?"



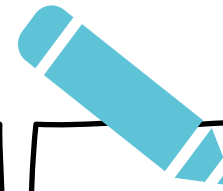
## KNOW IT

1. Do I know why the play is called DNA?
2. What is emotion memory?
3. How does emotion memory help us act well?
4. What can strong emotions do to our physicality?
5. How can improvisation help us develop understanding?
6. How do we show the level of power and authority a character has on stage?



## THINK IT

1. DNA (Deoxyribonucleic acid) is unique to lifeforms and contains the information on how it is built and grown, the play is called DNA because it is about a crime and our inbuilt behaviours and nature
2. Emotion memory is where we take feelings and experiences from our own lives and use them in performance
3. It can make a character, situation or relationship feel much more real
4. Any strong emotion can change our Posture, Gesture, Facial Expression, Movement or voice, even if we try to suppress it.
5. Improvisation forces our actors to spend time thinking about, and performing as our characters. This makes them more detailed and realistic.
6. Partially we are going to control this ourselves through physicality and voice, but the others on stage play a role by changing their positions on stage and how they react to us.



## GRASP IT

### Challenge: Ranking

People watching is fun. It can help develop your understanding of how relationships and power are demonstrated.

See if you can give a group of people you are watching a rank (1-10) for the following:

- |           |               |
|-----------|---------------|
| 1) Power  | 4) Love       |
| 2) Stress | 5) Popularity |
| 3) Anger  |               |

Challenge: Try to think about the powerful emotions which are easy to recall. Without exploring any nasty emotions, try to explore what changes you can notice about yourself when thinking about those experiences and emotions in front of a mirror.

Think of a way you could apply this to a character you have explored.

# English: Jane Eyre

## 1. Character List

**Jane Eyre** – A young, intelligent, and passionate orphan.

**Mrs Reed** – Jane’s aunt. She neglects and abuses Jane and is glad to send her away to Lowood School.

**Bessie Lee** – The house maid at Gateshead who is often kind to Jane.

**Miss Abbot** – Mrs. Reed’s maid.

**John Reed** – Jane’s cousin, Mrs. Reed’s son.

**Georgiana Reed** – Jane’s cousin and one of Mrs. Reed’s two daughters.

**Eliza Reed** – Jane’s cousin and one of Mrs. Reed’s two daughters.

**Mr. Lloyd** – The Reeds’ apothecary, who suggests that Jane be sent away to school.

**Mr Brocklehurst** – The cruel governor of Lowood school.

**Helen Burns** – Jane’s friend. She inspires Jane to be more patient and accepting.

**Miss Temple** – The kind and understanding teacher at Lowood.

**Miss Scatcherd** – Jane’s sour and vicious teacher at Lowood.

## 2. Key Words

**Orphan** – a child whose parents have died.

**Dependent** – someone who relies on another person to support them financially.

**Oppress** – to treat a group of people in an unfair way, often by limiting their freedom.

**Vulnerable** – at risk of harm or danger.

**Neglect** – to fail to care for properly.

**Abuse** – to treat with cruelty or violence; physically or mentally.

**Resent** – feel angry or bitter at having been treated unfairly.

**Rebellious** – showing a desire to resist authority, control, or convention.

**Stoical** – enduring pain and hardship without showing one's feelings or complaining.

**Tenacious** - not readily giving up.

**Arrogant** - having or revealing an exaggerated sense of your own importance or abilities.

**Compassionate** - feeling or showing sympathy and concern for others.

**Perplexed** - completely baffled; very puzzled.

**Humiliate** - to make someone feel stupid or ashamed.

**Hypocrite** - someone who says one thing but does the opposite at another time.

**Context** – real life factors that explain why a text was written

## 3. Plot Summary

**Chp 1** On a bitter day, Jane is curled up with a book when her cousin, John Reed, discovers her and hits her. She fights back and is sent to the red-room.

**Chp 2** Jane is locked in the red-room. She sits in confusion until she hears and sees something odd. She begs to be let out. She faints.

**Chp 3** Jane wakes up in the nursery. Bessie and Mr Lloyd are there. Jane is miserable. Mr Lloyd talks to Jane about going to school.

**Chp 4** Jane is visited by Mr Brocklehurst, the headteacher at Lowood School. After his visit, Jane and Mrs Reed argue. Jane says she will never call her ‘aunt’ again.

**Chp 5** Jane travels to Lowood School. She meets Miss Temple, the kind teacher, and Helen Burns, another pupil.

## 4. Social and Historical Context

- Jane Eyre was written in the Victorian era: 1847; a time when female writers were not taken seriously.
- The Industrial Revolution created new wealth and British society had sharp divisions between the classes.
- The aristocracy (upper class) was challenged by people with new wealth. Their children were mostly educated at home by tutors or governesses.
- Strict rules of behaviour were set between the lower classes and the aristocrats.
- Christianity was very important to people of all classes.
- Only men went to university.
- Parts of ‘Jane Eyre’ were influenced by Brontë’s experiences at school and as a young woman.
- ‘Jane Eyre’ was unusual when it was published because it is written in the first-person from a female perspective.

## 5. Themes

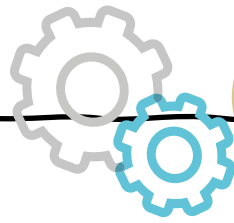
- Childhood
- Religion & Spirituality
- Gender Roles & Social Class
- Family, Friendship & Love
- Rules & Authority & Judgement
- The Supernatural





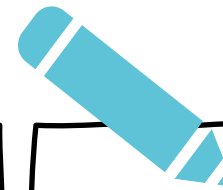
## KNOW IT

1. Give a definition of each key word.
2. List all the characters in the text.
3. List all the figurative language techniques that you can recall.
4. What does PETAL stand for?
5. How are the characters related to each other?
6. Can you summarise the plot in 50 words?
7. Can you list the 10 most important plot points?
8. Can you put the main plot points into chronological order?
9. Which 5 words best describe the protagonist?
10. Which 5 words would you use to describe other key characters?
11. What are the main themes in the text?
12. What are the social and historical links to the text?
13. What is unusual about the way the Charlotte Bronte wrote Jane Eyre?



## THINK IT

1. How do you use the PETAL paragraph structure to write a character analysis?
2. Why is the context of a play/novel important?
3. How do the main themes link to the protagonist?
4. How do the main themes link to other characters in the text?
5. Is the author challenging, endorsing, or simply reflecting the dominant ideas and assumptions of the time and place in which they are writing?
6. Write Jane's diary as she thinks about going to school.
7. How is life at Lowood School similar to life in the workhouse from 'Oliver Twist'? What are the differences?
8. Do you think that Mr Brocklehurst and Mrs Reed should be trying to change Jane's personality? Explain your answer using references to the novel.



## GRASP IT

1. What is the impact of the opening of the text?
2. What is the impact of figurative language use within the text?
3. Why are the key themes important for the reader/audience to understand?
4. Why might a modern-day audience or contemporary reader criticise the author's intended message?
5. How has discipline in schools changed since 'Jane Eyre' was written? Why do you think it has changed so much?
6. Who do you think has the right attitude to forgiveness and revenge, Jane or Helen Burns? Are either of them totally correct? Why does Jane feel the way she does?
7. What was consumption in the Victorian era? What name do we call it today? What causes it? How can it be treated or prevented?
8. Scientists in the Victorian era believed in the miasma theory (<https://www.bl.uk/victorian-britain/articles/health-and-hygiene-in-the-19th-century>). What was the miasma theory? Was it accurate? What do scientists believe now? How did John Snow and the Broad Street pump influence scientific thinking (we studied this last year)?
9. <https://www.bl.uk/romantics-and-victorians/articles/the-figure-of-the-governess>  
<http://www.victorianweb.org/gender/wadso2.html> Find out more about the role of a governess in Victorian life. What was good about life as a governess? What was bad about it?

### 6. Links to Prior Learning

- Jane Eyre is a **vulnerable** character much like Hermia from 'A Midsummer Night's Dream' and - to a certain extent - Miranda from 'The Tempest'.
- Mrs. Reed **neglects** and **abuses** Jane in the same way that Cinderella's/Hansel and Gretel's step-mothers treat them in the 'Origins of Fiction' and 'Ancient Tales'.
- John Reed, Mr. Brocklehurst and Miss Scatcherd all **abuse** their power to control Jane just as Napoleon (and the rest of the pigs) abuse their power to create **inequality** and control the other animals in 'Animal Farm'.
- Bessie does not speak out against the poor treatment of Jane due to her low position in the house. This is a similar set of circumstances to those faced by Echo in the Greek myth. She could not speak out about Zeus's **deceit** because she was only a common nymph.
- Jane Eyre and Irene Adler (a Scandal in Bohemia) both challenge **gender expectations** by standing up to the **patriarchy**.

# English: Small Island

## 1. Character List

- Hortense** – grows up in Jamaica with Michael’s family. Moves to England with hopes of becoming a teacher.
- Michael** – grows up alongside Hortense. A charming and charismatic man.
- Gilbert** – Jamaican who joins the RAF in WW2. Marries Hortense.
- Queenie** – grows up in England. She is fair, open-minded and has a very big and kind heart.
- Bernard** – grows up in England. Extremely reserved. Marries Queenie.
- Arthur** – Bernard’s father. Suffers from shell-shock.
- Mrs Ryder** – is the teacher at the local school in Jamaica. Has an affair with Michael.
- Mr Philip** – Michael’s father. A very religious man.
- Miss Jewel** – Hortense's grandmother, who works as a servant in Michael’s house.
- Aunt Dorothy** – Queenie’s aunt who owns a shop in London.
- Elwood** – Gilbert’s brother.
- Mrs Todd** – lives in Queenie’s building. Has racist views.

## 2. Key Words

- adversity** – an extremely difficult situation
- adverse** – extremely difficult
- ambition** – something you want to achieve in life
- colony** – country that is ruled by a foreign nation
- colonisation/colonialism** – the act of taking over a country to become a colony
- dignified** – worthy of honour and respect
- discriminate** – to treat someone or a group of people unfairly because of their sex, race, religion or disability
- euphemism** – polite phrase that hides an unpleasant meaning.
- stigma** – a set of negative and often unfair beliefs that a society or group of people have about something
- characterisation** – the creation or construction of a fictional character
- context** – what was happening in real life at the time a text was written
- monologue** – a long speech by one actor
- tableau** – actors freeze in the middle of the action
- patriarchal** – a society/community where men have all the power.
- multi-cultural** – having people from many different countries and religions.

## 3. Plot Summary

The play opens in Jamaica - 1939. Hortense prepares for the arrival of a hurricane and tells her story. The hurricane hits. Michael appears, shoving Hortense out of the way and rushing to passionately kiss Mrs Ryder. We then move to England – 1941. Queenie rents out rooms in Bernard’s house to soldiers. There is an instant attraction between Queenie and Michael. Hortense says she will lend Gilbert the money for the passage to England, if he marries her and sends for her once he has a place to live in England. The play ends in London- 1948. Gilbert and Hortense are discriminated against by colleagues, neighbours and Bernard. Queenie gives birth to Michael’s baby. Queenie hands her baby to Hortense and Gilbert. They promise they will be proud of the child and he will be loved.

**Hortense** is a Jamaican woman. As a child she is given away by her mother in the hope that she has a better life. She is clever and proud. At the beginning of the play, Hortense has strong views about morality and the world. Hortense marries Gilbert not because she loves him, but so that she can go to England and fulfil her ambition of becoming a teacher in a country where she will be respected - ‘no-one will feel sorry for I’. Hortense struggles to adjust to the reality of life in England as her dreams of being a teacher are rejected. At the end of the play, Hortense’s feelings for Gilbert transform into love and pride at the end of the play when he addresses Bernard after his racist outburst.

**Gilbert** is a Black Jamaican man. His ambition is to become a lawyer in England. Gilbert is intelligent, charming and kind. Like Michael, he joins the RAF during The Second World War. Gilbert is a positive character who, like Hortense, has to adapt to the adverse situations he finds himself in. At the end of the play, Gilbert becomes mature and responsible by adopting baby Michael as his own with Hortense. He also realises that Hortense is worth ‘more than the price of a ticket’ to England. He ends the play with dignity and Hortense’s admiration.

**Queenie** is a British woman. At the start of the play, Queenie dreams of romance and having her own family. Queenie marries Bernard, but she is unhappy in her marriage. She says ‘It’s not what I imagined for myself’. Queenie is overwhelmed by the stigma of raising a black child. At the end of the play, she gives baby Michael away saying, ‘You know what? I don’t think I’ve got the guts for it’.

**Bernard** is an English man. Bernard is quiet, nervous and old-fashioned. His ambition is to impress Queenie. Bernard is hostile to anyone who’s not of his own race or class. Bernard typifies the racist attitudes that were prevalent in post-war Britain. His unwillingness to change his attitude makes him an unsympathetic character.

## 4. Social and Historical Context

- Small Island is a novel written by Andrea Levy.
- In 2019, it was adapted into a play by Helen Edmundson.
- The story is based on the real experiences of Andrea Levy’s parents who came to England on the **Empire Windrush** in 1948.
- After WW2, England needed help to rebuild society.
- 1000 people emigrated from the Caribbean to England on the Empire Windrush.

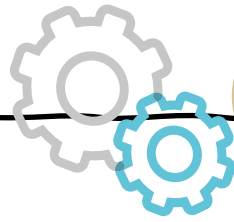
## 5. Themes

- Racism
- Etiquette
- Redemption
- Belonging
- Gender
- Ambition



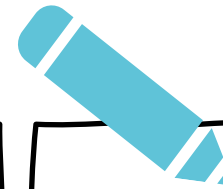
## KNOW IT

1. Give a definition of each key word.
2. List all the characters in the text.
3. List all the figurative language techniques that you can recall.
4. What does PETAL stand for?
5. How are the characters related to each other?
6. Can you summarise the plot in 50 words?
7. Can you list the 10 most important plot points?
8. Can you put the main plot points into chronological order?
9. Which 5 words best describe the female protagonists?
10. Which 5 words would you use to describe other key characters?
11. What are the main themes in the text?
12. What are the social and historical links to the text?
13. What is unusual about the ending of the play?



## THINK IT

1. How do you use the PETAL paragraph structure to write a character analysis?
2. Why is the context of a play/novel important?
3. How do the main themes link to the protagonists?
4. How do the main themes link to other characters in the text?
5. Is the author challenging, endorsing, or simply reflecting the dominant ideas and assumptions of the time and place in which they are writing?
6. How is an audience meant to respond to Michael's character? Why?
7. Bernard has returned from war after a long and unexplained absence. Queenie asks why he didn't write her a letter. Imagine you are Bernard. Write a letter to Queenie explaining what happened to you in the war, and why you have found it so difficult to return.
8. You have looked more in depth at the character of Arthur. He has a strong bond with Queenie. Describe their relationship. Use one stage direction and one quotation in your description.



## GRASP IT








1. What is the impact of the opening of the text?
2. What is the impact of figurative language use within the text?
3. Why are the key themes important for the reader/audience to understand?
4. Why might a modern-day audience or contemporary reader criticise the author's intended message?
5. What was the Blitz? In what ways did it effect the civilian population? What do people who experienced the Blitz say about it?
6. Look at the stage directions which open Act One (page 9) and the stage directions which open Act Two (page 79). What are the differences? Why do you think Edmundson created such stark differences?
7. In lesson 11, you read an extract from 'Small Island', the novel. Listen to Andrea Levy talking about the novel here <https://www.youtube.com/watch?v=WyUR6gZyYLE> (search *Small Island* novel and watch the 2 minute 51 second clip). Why was Andrea Levy surprised by the reception of the novel?
8. In lesson 14, you read about the experience of Floella Benjamin. She is a Trinidadian-British actress, author, businesswoman, politician, presenter and singer. Make a fact file about her. You can explore her website here. <http://www.floellabenjamin.com/>

### 6. Links to Prior Learning






- The Elizabethan age of exploration; **colonialism**; 'The Tempest' looks at these topics. 'Small Island' is based on the experiences of *The Windrush Generation*.
- Family relationships during/after WW2 are examined. This is also a theme in 'A Midsummer Night's Dream' and 'The Tempest'. The expectations of a **patriarchal** society also run through all three plays.
- Issues within a **multi-cultural** society are highlighted (also true of 'The Tempest').

# Food: Nutrition

## 1. Macronutrients and Micronutrients

| Nutrient                 | Job/Function in the body  | Sources               | Image  |
|--------------------------|---|-----------------------|--|
| Fats<br>(Macro)          | To protect your internal organs.<br>To provide insulation of internal organs. | Cheese, Sausages      |    |
| Protein<br>(Macro)       | To assist growth and repair of cells.<br>Helps hormone production.            | Chicken, Fish, Beans  |    |
| Carbohydrates<br>(Macro) | The bodies main source of energy.<br>Helps control blood sugars.              | Pasta, Rice, Potatoes |    |
| Vitamins<br>(Micro)      | Vitamin C - To help keep skin healthy.<br>To help support Immune system.      | Oranges, Strawberries |    |
| Vitamins<br>(Micro)      | Vitamin A – To help with eye health.<br>To help cell production.              | Carrots, Broccoli     |   |
| Minerals<br>(Micro)      | Iron - To make red blood cells.<br>Provides energy.                           | Red Meat, Spinach     |  |
| Minerals<br>(Micro)      | Sodium – To balance water in body .<br>Relaxes muscles.                       | Crisps, bacon         |  |

## 2. Key Temperatures

| Temperature | Description   | Image   |
|-------------|---|---|
| 5-63C       | The danger zone, where bacteria grow most readily.                            |    |
| 37 C        | Body temperature, the perfect conditions for bacteria to grow.                |    |
| 0 – 5 C     | The temperature that a Fridge should be.                                      |    |
| -18 C       | The temperature of a Freezer.   |   |
| 75 C        | when cooking food, the thickest part should be a minimum of this temperature. |  |

### 3. 4 Cs

Food hygiene is necessary in order to make food which is safe to eat. This involves more than just being clean. A simple way to remember all the important areas where safety could be an issue are the **4Cs**:

- Cooking
- Cleaning
- Chilling
- Cross-contamination

What does bacteria need to grow?

Food, PH, Temperature, Time, Oxygen, Moisture

- Bacteria grow best in the danger zone which is **between 5°C and 63°C**
- Below 5°C they are dormant, this means that grow very slowly or not at all
- Above 63°C they are mainly destroyed by the heat.

### 5. Nutrients

| 5. Nutrient   | Food Examples   | Main Function in Body  |
|---|---|--|
| <b>Macronutrients - We need these in large amounts.</b> |   |  |
| <b>Starchy Carbohydrates</b>                            | Cereals, bread, rice, potatoes, pasta etc.  | Give us slow release energy. (wholegrain versions are higher in fibre).                                  |
| <b>Protein</b>  | Meat, fish, eggs, nuts, seeds, pulses, lentils.                                   | Growth, repair and maintenance of muscles. Needed for healthy red blood cells.                           |
| <b>Fat</b>  | Butter, lard, margarine, sunflower oil, olive oil etc.                            | Protects our vital organs (heart, lungs etc) and keeps us warm.  |
| <b>Micronutrients - We need these in small amounts.</b> |   |  |
| <b>Vitamins</b>   | Fruits and vegetables.  | Help our immune system fight off illnesses and help us release energy from other foods. Keeps us healthy |
| <b>Minerals</b>   |   |  |
| <b>Other Essential Nutrients</b>                        |   |  |
| <b>Dietary Fibre (NSP)</b>                              | Wholegrain cereals, fruit/vegetables, nuts/seeds etc                              | Helps our digestive system remove waste and avoid constipation.  |
| <b>Water</b>  | Keeps us hydrated, controls body temperature, helps digestion, gets rid of waste. |  |

### 4. Food Miles - The distance food travels from Farm To Fork

**Locally Sourced Foods** – A way of reducing food miles is to buy locally sourced foods, these are also seasonal and can sometimes be organic too.



**Seasonal Foods** - Foods that are harvested and eaten in the season they are naturally ready to eat.

Most **UK-grown fruit and vegetables** are not available all year round.



### 6. Other Factors Affecting Food Choice

Many people follow '**special diets**'. They must choose or avoid foods carefully for a range of different reasons.

**Cost:** Some families must budget due to low incomes.

**Age Groups:** Different age groups have different nutritional needs.

**Health Reasons:** E.g. obesity, type 2 diabetes, anaemia, osteoporosis.

**Vegetarian/Vegan:** Don't eat meat/Don't eat or use ANY animal products.

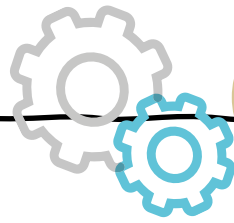
**Religion:** E.g. Hindu, Muslim, Kosher, Buddhist, Rastafarian etc.  
**Intolerances:** E.g. intolerance to wheat/gluten, dairy/lactose etc.

**Allergies:** E.g. nuts, shellfish, fish, eggs, wheat, dairy etc.



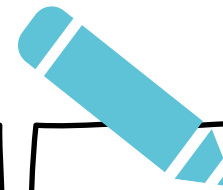
## KNOW IT

1. Define what macronutrients and micronutrients are?
2. Describe how mold affects food.
3. What is contamination?
4. Where would you store low risk foods?
5. What temperature should a fridge be set to?
6. What factors affect food choices?
7. What does food miles mean and how is it affecting our environment?



## THINK IT

1. Explain the function of macronutrients and micronutrients.
2. Explain how bacteria grow and multiply in food.
3. Discuss why you would use different coloured chopping boards when preparing meals.
4. Discuss why it is important to store raw meat in the fridge, wrapped/ sealed and on the bottom shelf.
5. Identify what a high risk food is and give examples
6. Explain the different reasons why many people follow a special diet?
7. Identify ways that food waste can be reduced.



## GRASP IT

1. Discuss the importance of Macronutrients and Micronutrients?
2. Discuss what consumers should look for when purchasing food from a shop or market stall to ensure that it is safe.
3. Consider what would happen if a piece of raw chicken was left on a kitchen worktop for 4 hours.
4. Compare the use of 'best before' and 'used by Bacterial Contamination dates' on food packaging.
5. Justify the importance of stock rotation when storing food at home.
6. Draw a mind map of all the reasons that people follow a special diet, highlight key words.
7. Consider how you could reduce food waste at home, look what's in the cupboards, freezer and fridge. Think what your recipe you could adapt to reduce waste going into the landfill.

# Geography: Exploiting the World

## 1. Resources

We need resources for every part of our lives. Fossil fuels such as oil, coal and natural gas are finite resources that we can not rely on forever, making them **non-renewable**. Because of this the development of renewable energy sources are becoming increasingly relied upon. These include: solar, tidal, wind and nuclear. There are many advantages and disadvantages to using renewable energy sources :

Ads (+)

- Reduce CO2 emissions ,sustainable, create jobs and save large amounts of money

Disads (-)

- Wind turbines are ugly, ruin the natural beauty of the countryside
- Nuclear power plants may leak dangerous chemicals into the ground water impacting ecosystems.

## 2. UK –food and water: distribution, supply and demand

Due to the population of the UK increase demand for resources such as food and water are on the rise. Some parts of the UK have a food/water **surplus** whilst others have a food/water **deficit**. Therefore both of these are not even distributed across the country.

### Food –UK

Due to our climate the UK cannot grow lots of produce that as a population we like to buy and consume. If more of the population ate more seasonally then the amount of food needed to be imported would decline. To combat this the government/farmers and local businesses have promoted more **sustainable** food sources.

### Water- UK

We use water throughout the day for washing, cleaning, drinking and eating. Due to population growth in the UK the demand for water in our homes is growing significantly. Certain parts in the UK now have a water deficit and a water surplus – the south of England is the main areas of the UK with not enough water for its demand.

Managing water in the UK- due to demand the government needs to save water. This is being done through water transfer schemes – water is being transferred by pipelines from areas with a water surplus e.g Wales and then connected to areas in a water deficient.

## 3. WOW WORDS

**Energy mix** – the use of a range of different energy sources.

**Energy security**- the availability of energy resources. Food miles- the distance food travels from production to plate.

**Surplus**- enough of something e.g water

**Deficit** – deficient/lacking in something e.g water

**Fracking** - process of injecting liquid at high pressure to extract oil or gas.

**Sustainable living**- means understanding how our lifestyle choices impact the world around us and finding ways for everyone to live better

**DTM**- demographic transition model – a model to show population change over time. This is separated into stages.

## 5. Oil

**Crude Oil:** also known as oil/ petroleum (petrol) is naturally occurring and created by dead marine animals sink to the bottom of the ocean and covered by sedimentary rock. Oil is predominately transported by pipelines and oil tankers, both methods have positive and negative impacts e.g cost Vs Efficiency. Oil is also known as '**black gold**' or '**liquid gold**' due to the amount of money it can make countries and governments – this is the case in the Middle East.

### Oil spills – Israeli Oil Spill 2014

This event caused many social, economic and environmental problems for those affected. The spill cost \$4.4 billion, it contaminated Nature reserves, water sources and breathing difficulties were the communities surrounding the oil spill.

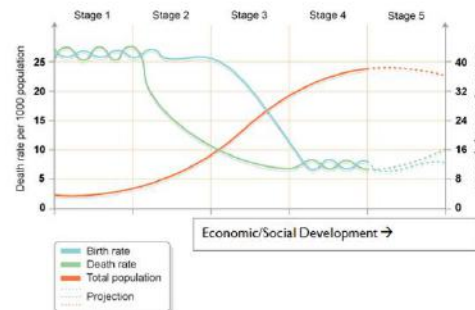
## 4. Russia

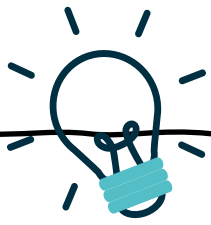
**Location :** Russia is located between two continents, Europe and Asia.

**Population:** the majority of Russia's population live in the North-west of the Country – Moscow is located here. Due to Russia's climate and terrain it is Hard to leave in other parts of the country. Russia is in stage 5 of the DTM- This means it has a declining and aging population with a low birth rate.

**Resources:** Russia is very resource rich, they contain 30% of the world's Oil and gas resources. Due to the war with Ukraine this is impacting the UK's Supply of both oil and gas.

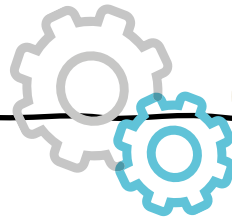
**Super power:** Russia is known as a global 'super power'. Russia is the largest Country, has access to natural resources, has a 'stable' government It has a strong culture and powerful allies. Russia made \$300 billion for the Export of oil in 2021.





## KNOW IT

1. What does resource management mean?
2. How is the world's energy distributed globally?
3. How has the UK's energy mix changed?
4. Why is it important we create an energy mix in the UK by using renewable energy?
5. Why is the UK using more renewable energy?
6. Why does the UK import 47% of its food?
7. What are food miles and how does it link to our carbon footprint?
8. How can we reduce our reliance on imported food?
9. What are the advantages and disadvantages of fracking?
10. Where does the UK have a water deficit and surplus?
11. How can the UK reduce its water usage?



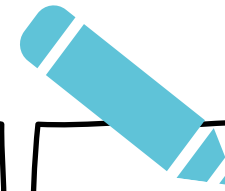
## THINK IT

**“The Middle East should continue to focus on oil production”**

**Task: Create an argument for and against this statement.**

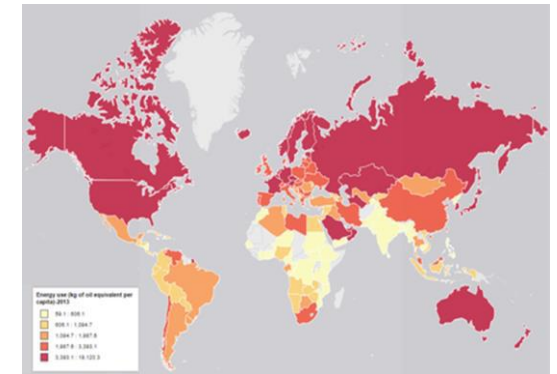
### Success criteria:

- Where is the middle east
  - Why does it produce so much oil
  - Why is the Middle East reliant on producing and trading with oil
  - Oil spill – what were the environmental, social and economic costs
  - What is the future looking like in the middle east? Hint: rise of electric cars.



## GRASP IT

1. Describe the pattern of energy consumption around the world (darker red = more consumed)
2. Why is energy consumption increasing?



3. Summarise in no more than 30 words exactly what happens during the fracking process



# History: Civil Rights Movement

## 1. 1950's

- Brown V Board of Education provided the legal means to challenge segregation in schools.
- Murder of Emmett Till trial of murderers saw all of them released by an all-white male jury.
- Montgomery Bus Boycott started due to Rosa Parks being arrested for not giving up her seat.
- Little Rock saw the first testing of the Brown V Board of Education.

## 2. 1960's

1960-1968: Many black people, even in the south, had become much more politically aware. Increasing numbers of white people were beginning to support the call for equal Civil Rights for black people. President Kennedy was proposing to pass laws to give black people greater rights and huge demonstrations took place to try to support him. In 1963 Martin Luther King led a march in Birmingham Alabama to end segregation. The year before the council in Birmingham had closed all public recreational facilities, like parks and swimming baths to black people. 30,000, mostly black Americans took part in sit-ins in these facilities.

## 3. Key Events

|                               |           |
|-------------------------------|-----------|
| Brown V Topeka                | 1954      |
| Montgomery Bus Boycott        | 1955      |
| Murder of Emmett Till         | 1955      |
| Little Rock Nine              | 1957      |
| 'Sit in' and 'Freedom Riders' | 1960-1961 |
| Civil Rights Act              | 1964      |
| Black Panther Movement        | 1966      |
| MLK's assassination           | 1968      |
| Voting Rights Act             | 1970-1975 |

## 4. WOW WORDS

Jim Crow: Laws passed in the southern states to stop equality.

Segregation: The separation of black and white people in schools, public transport and other public places.

Lynching: A tactic used by the KKK which led to the illegal execution of black people by a mob.

## 5. Martin Luther King

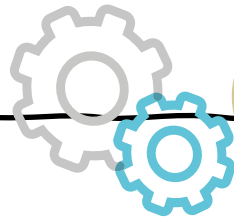
Impacts of MLK:

- Publicity to major civil rights activities and efforts
- Encouraged non-violent protest and resistance
- Provided leadership to the African-American civil rights movement
- "I Have a Dream" speech saw a shift in people's perspectives of the civil rights movement
- Helped establish the Southern Christian Leadership Conference (SCLC) in 1957.



## KNOW IT

1. What was Jim Crow?
2. What law changed segregation in the school system?
3. Why was MLK's speech influential?
4. How did President Kennedy help the Civil Rights Movement?
5. Why was Emmett Till's trial so important?
6. Who started the bus boycott?
7. What tactic was used by the KKK to scare black communities?



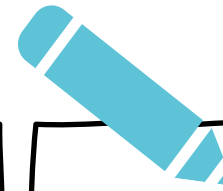
## THINK IT

Prioritise the impact of MLK from the most important to the least.

What do you think is the biggest impact of MLK and why?

Impacts of MLK:

- Publicity to major civil rights activities and efforts
- Encouraged non-violent protest and resistance
- Provided leadership to the African-American civil rights movement
- "I Have a Dream" speech saw a shift in people's perspectives of the civil rights movement
- Helped establish the Southern Christian Leadership Conference (SCLC) in 1957.



## GRASP IT

Use the Key events box on the previous page to chose your favourite SIX events.

Create a storyboard of the SIX major events which helped improve civil rights in America.

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# Modern Foreign Language: Mon Temps Libre

## 1. NEGATIVES IN PRESENT TENSE

To make a sentence negative in French, you place a negative phase on either side of a conjugated verb, making a 'sandwich'.

ne + pas = not  
ne + jamais = never  
ne + plus = no longer

I do **not** play football – je **ne** joue **pas** au foot

I **never** go to the cinema – je **ne** vais **jamais** au cinéma

I **no longer** play video games – je **ne** joue **plus** aux jeux-vidéos

## 2. KEY VERBS IN PRESENT TENSE

|                        |  |
|------------------------|--|
| je joue [I play]       | <b>au foot/au rugby/aux jeux vidéos</b> [football/rugby/videogames]<br><b>du piano/de la batterie</b> [the piano/the drums]<br><b>de la musique</b> [some music]<br><b>sur mon portable</b> [on my phone]<br><b>en ville/au parc</b> [in town/at the park]<br><b>du sport/du vélo/du judo</b> [sport/cycling/judo]<br><b>de la danse/de la natation</b> [dance/swimming]<br><b>des magasins</b> [shopping] |
| j'écoute [I listen to] |  |
| je tchatte [I chat]    |  |
| je traîne [I hang out] |  |
| je fais [I do]         |  |
| je regarde [I watch]   | <b>la télé à la demande/les séries</b> [tv on demand/series]   |
| je vais [I go]         | <b>au cinéma/aux magasins/en ligne/sur Snapchat</b>  |

## 3. STAR WORDS

|                                   |  |
|-----------------------------------|--|
| on rigole                         | We have a laugh                        |
| c'est ma passion                  | It's my passion                        |
| C'est mon truc                    | It's my thing                          |
| ça me détend                      | It relaxes me                          |
| on peut bavarder ensemble         | We can chat Together                   |
| Ça me rend heureux                | That makes me Happy                    |
| <b>C'était</b> une perte de temps | <b>It was</b> a waste of Time          |
| <b>Ce sera</b> bon pour la santé  | <b>It will be</b> good for your health |

## 4. TIME PHRASES IN 3 TENSES

|                      |              |
|----------------------|--------------|
| Quelquefois          | Sometimes    |
| Tous les jours       | Everyday     |
| Souvent              | Often        |
| Le vendredi          | On Fridays   |
| Après le collège     | After school |
| Hier                 | Yesterday    |
| Vendredi dernier     | Last Friday  |
| La semaine dernière  | Last week    |
| Demain               | Tomorrow     |
| Vendredi prochain    | Next Friday  |
| La semaine prochaine | Next week    |

## 5. PAST TENSE

To make a sentence in the past in French, you need the auxiliary "avoir" and the verb in the past participle form (é at the end).

J'ai joué – I played  
Tu as joué – you played (singular)  
Il / elle a joué – he / she played  
Nous avons joué – we played  
Vous avez joué – you played (plural)  
Ils / elles ont joué – they played

e.g. j'ai écouté de la musique – I listened to music

## 6. NEAR FUTURE TENSE

To make a sentence in the near future in French, you need the verb "to go" – "aller" in the present tense, followed by an infinitive.

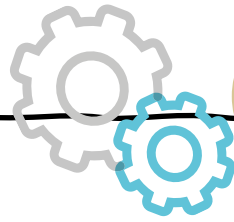
Je vais jouer – I'm going to play  
Tu vas jouer – you are going to play (singular)  
Il / elle va jouer – he / she is going to play  
Nous allons jouer – we are going to play  
Vous allez jouer – you are going to play (plural)  
Ils / elles vont jouer – they are going to play

e.g. je vais traîner en ville avec mes amis – I am going to hang out in town with my friends



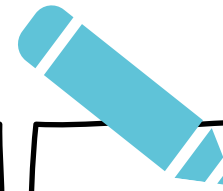
## KNOW IT

1. Translate: Quelquefois je joue au foot.
2. Translate: Le weekend je fais des magasins avec mon amie.
3. Translate: Après le collège je vais en ligne avec mes amis.
4. What tense do these time phrases indicate? Hier/ le weekend dernier/ vendredi dernier
5. Translate: Hier j'ai joué de la batterie avec mon petit copain.
6. Hier j'ai joué foot avec mon ami. What is missing in this sentence?
7. Translate: Je joue au tennis avec mon frère.
8. Translate: Je traîne an ville.
9. Translate: Tous les jours je fais de la natation.
10. Translate: Le soir je vais sur Snapchat.



## THINK IT

1. Rewrite sentence 1 and change the time phrase.
2. Rewrite sentence 2 and change 'who with'
3. Adapt sentence 3 and change the activity (verb phrase)
4. Write a sentence using one of the time phrase in 4 using 'je'
5. Rewrite sentence 5 to change 'who with' to a family member.
6. Upgrade sentence 6 to include an opinion.
7. Transform sentence 7 to past tense.
8. Transform sentence 8 to past tense.
9. Transform sentence 9 to past tense and change time phrase.
10. Transform sentence 10 to past tense and change time phrase.



## GRASP IT

1. Include an opinion in sentence 1.
2. Include 'it's my thing' to extend the sentence.
3. Include an opinion in sentence 3.
4. Attempt sentence 4 using a different person of the verb.
5. Include an opinion in sentence 5.
6. Upgrade sentence 6 to include an opinion and a connective.
7. Transform sentence 7 to near future tense.
8. Transform sentence 8 to near future tense.
9. Transform sentence 9 to near future tense and change time phrase.
10. Transform sentence 10 to near future tense and change time phrase.

# Music: Keyboard Skills - All that Jazz

## 1. PRIMARY CHORDS IN C MAJOR

**What are the Primary Chords?**  
I IV V

In any scale – the primary chords are always I IV V (1, 4, 5) as these contain between them all the notes of the scale.



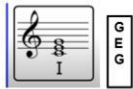
For a C Major scale, I IV V would look like:



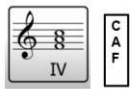
C Major

I = CEG  
IV = FAC  
V = GBD

I IV V



I  
GEG



IV  
CAF



V  
DBG



## 3. 7<sup>TH</sup> CHORDS AND IN 12 BAR BLUES STRUCTURE



C7  
B<sup>b</sup>  
G  
E  
C



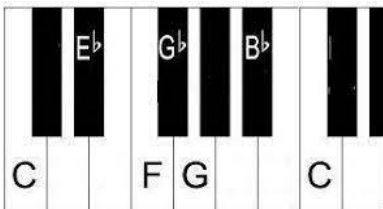
F7  
E<sup>b</sup>  
C  
A  
F



G7  
F  
D  
B  
G



## 5. BLUES SCALE IN C



C blues scale



## 2. 12 BAR BLUES CHORD STRUCTURE

|                   |                   |                  |                  |
|-------------------|-------------------|------------------|------------------|
| C ///<br>I = CEG  | C ///<br>I = CEG  | C ///<br>I = CEG | C ///<br>I = CEG |
| F ///<br>IV = FAC | F ///<br>IV = FAC | C ///<br>I = CEG | C ///<br>I = CEG |
| G ///<br>V = GBD  | F ///<br>IV = FAC | C ///<br>I = CEG | C ///<br>I = CEG |

## 4. WALKING BASS LINE

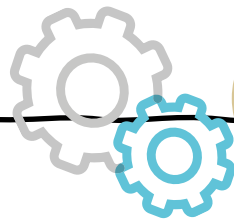
## 6. KEYWORDS

|                |   |
|----------------|---|
| ROOT NOTE      | First note in a chord                             |
| TRIAD          | A chord containing three pitches                  |
| PRIMARY CHORDS | I, IV and V (1, 4 and 5)                          |
| STRUCTURE      | How the music is organised                        |
| 12 BAR BLUES   | Chord structure that uses the 12 bar Blues        |
| WALKING BASS   | Broken chord pattern that moves in crotchets      |
| IMPROVISATION  | Making up music on the spot                       |
| BLUES SCALE    | A 6 note scale used in jazz with flat, blue notes |



## KNOW IT

1. Where do you find a letter C on the keyboard?
2. Identify the notes (letter names) in a C major scale?
3. Define triad.
4. Define root note.
5. What are primary chords?
6. What are the primary chords in C major?
7. What finger should you use for the root (first note) of each chord in your right hand?
8. How many bars in a typical Blues chord structure?
9. How many beats in a bar in Blues music?
10. What is a walking bass?
11. What is a seventh chord?
12. Define improvisation.



## THINK IT

1. Can you circle the three primary chords from the C major scale below and label with the correct Roman numeral?

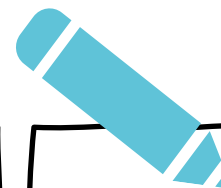


C Major

2. Fill in the missing Roman numerals in the 12 bar Blues chord structure.

|   |    |   |   |
|---|----|---|---|
| I |    |   |   |
|   | IV | I |   |
|   | IV |   | I |

3. Can you identify the four notes in a C7 chord?
4. Can you identify the four notes in an F7 chord?
5. What pitches are in the C blues scale?



## GRASP IT









1. Listen to the following extract and identify three instruments you can hear playing.

[Chuck Berry - Johnny B Goode \(1959\) - YouTube](#)

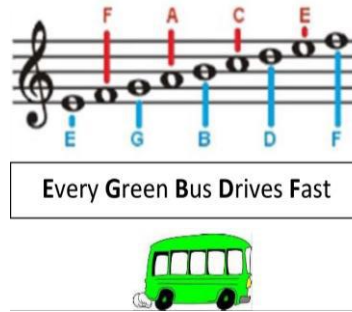
2. This piece uses a 12 bar Blues chord structure. Can you identify the chords used and describe how they are arranged?
3. How many beats are there in a bar?
4. Can you identify three other musical features of this extract of Blues music?

# Music: Theory

## 1. NOTE VALUES


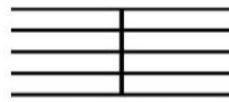
| Note Symbol   | Rest Symbol   | Note Value | Note Name |
|---|---|------------|-----------|
|  |  | 1/2        | Quaver    |
|  |  | 1          | Crotchet  |
|  |  | 2          | Minim     |
|  |  | 4          | Semibreve |

## 2. PITCHES


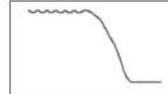



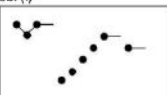
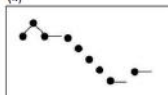
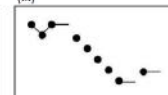
Every Green Bus Drives Fast

## 3. NOTATION SYMBOLS




| Notation Symbol   | Definition  |
|---|-------------|
|  | Treble clef |
|  | Bar line    |

## 4. NOTATION EXAMPLES

5a. (i)  (ii)  (iii) 

5b. (i)  (ii)  (iii) 

Graphic scores show the length of the notes and the pitch direction

5c. (i)  (ii)  (iii) 

Staff notation shows precise note lengths and pitches on a staff

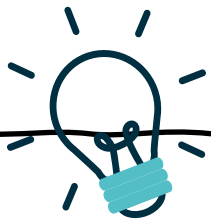
## 5. KEYWORDS

|                         |  |
|-------------------------|--|
| <b>PITCH</b>            | How high or low the note is                          |
| <b>TEMPO</b>            | Speed (how fast or slow)                             |
| <b>DYNAMICS</b>         | Volume (how loud or soft)                            |
| <b>RHYTHM</b>           | Different length notes in a pattern                  |
| <b>MELODY</b>           | Different pitches in a pattern                       |
| <b>TEXTURE</b>          | How much sound/many layers we hear (thick or thin)   |
| <b>TIMBRE/ SONORITY</b> | Tone quality of the instrument e.g. mellow or shrill |
| <b>ARTICULATION</b>     | How notes are played (smooth or detached)            |
| <b>DURATION</b>         | How long or short the note or music is               |
| <b>SILENCE</b>          | No sound at all                                      |

## 6. INSTRUMENTAL FAMILIES

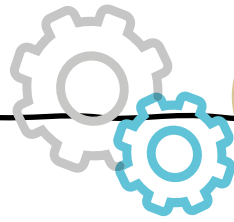




## KNOW IT

1. Define pitch.
2. Define tempo.
3. Define dynamics.
4. What is the note value of a crochet?
5. What is the note value of a quaver?
6. What is the note value of a minim?
7. State the four instrumental families.
8. What is a rhythm?
9. What is a melody?
10. Can you explain the term texture?
11. Can you explain the term timbre?
12. What is articulation?
13. What is a duration?

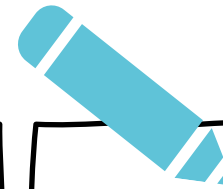
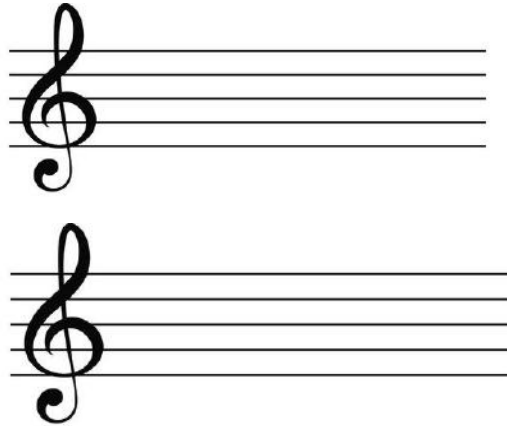


## THINK IT

1. Can you explain the difference between a graphic score and staff notation?
2. Can you identify an instrument from each instrumental family and describe its timbre?

WOODWIND  
BRASS  
STRINGS  
PERCUSSION

2. On the staff, draw and label the line and space pitches.



## GRASP IT

1. Complete the table below with the note values and note names.

| Note Symbol | Rest Symbol | Note Value | Note Name |
|-------------|-------------|------------|-----------|
|             |             |            |           |
|             |             |            |           |
|             |             |            |           |
|             |             |            |           |

2. Listen to a piece of music of your choice and describe the pitch, tempo and dynamics. What instruments can you identify and can you describe their timbres?



# Physical Education: Handball

## Skills & Techniques

**Chest pass:** This is a short and powerful pass, you have your hands in a W shape and push to extend your arms, you also step forward to give more power.

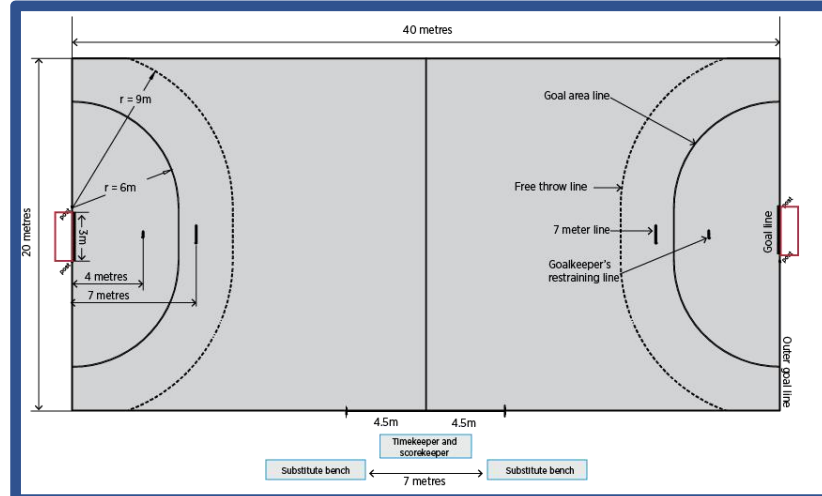
**Shoulder pass:** This is a long and powerful shot, you start with the ball in your strong hand next to your shoulder, you extend your arm and follow through with your body.

**Bounce pass:** This is a pass which is low to the ground, you use the same position as a chest pass but aim in  $\frac{3}{4}$  of the way between you and the person you are bouncing to.

**Overhead pass:** This is a double handed throw, similar to a football throw in. This is for long distances and to get the ball over someone if they are trying to block.

**Dribbling:** Players may dribble the ball as in basketball but are allowed three steps before and after the dribble. You need to keep the ball close to your body to help

## Court



## Game Rules Regulations

- Junior Players use a size 1 ball up to 14, then a size 2 ball up to 16.
- Each team consists of **7 players**; a goalkeeper and 6 outfield players.
- Outfield players can touch the ball with any part of their body that is above the knee
- The playing court is 40m long and 20m wide, with two goal areas and a playing area.
- The goals are 2m high and 3m wide.
- A player can- run 3 steps with the ball, hold the ball for 3 seconds, unlimited dribble with 3 steps (NO DOUBLE DRIBBLE).
- A player is not allowed: To endanger an opponent with the ball. To pull, hit or punch the ball out of the hands of an opponent. To go inside the goal area – penalty throw awarded. To dive on the floor for a rolling or stationary ball.

## Wow words

|                  |            |         |
|------------------|------------|---------|
| Attack           | Deception  | Defence |
| Dribbling        | Free throw |         |
| Goalkeeping      | Jump shot  |         |
| Passing          | Left side  |         |
| Right side       |            | Travel  |
| 7m penalty throw |            | Zonal   |





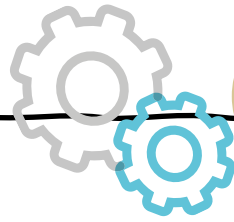
## KNOW IT

### Technical

1. How must you move with the ball?
2. How many seconds can you hold the ball for?
3. How can I attack space effectively?
4. What methods can I use to intercept the ball?
5. Where can an outfield player not go?
6. Which player can use their feet?

### Health, Fitness & Well-Being

7. How can exercise help my well-being?
8. Why do we warm up?
9. How can I train for invasion sports?
10. What are the principles of training?



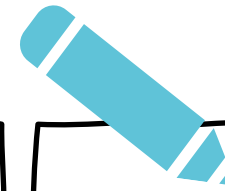
## THINK IT

### Technical

1. What do we call it when bouncing the ball?
2. Describe three things a player can do when they have the ball.
3. Why is attacking space important?
4. Where should you be to intercept a pass?
5. Give an example of creating space for your sport.
6. Why is this person allowed to use their feet?

### Health, Fitness & Well-Being

6. What mental benefits do you get out of playing invasion games?
7. What 3 components of a warm-up should be used?
8. How will this develop my body to give me an advantage?
9. How can they be applied to your training?



## GRASP IT

### Technical

1. What happens if you dribble the ball, stop, then dribble the ball again?
2. What are your three main options when you receive the ball?
3. Explain a situation where you might do each answer you gave in the question above.
4. Why is there a 7m line?

### Health, Fitness & Well-Being

5. How do you think sport will help you improve your physical literacy?
6. Explain a warm-up plan for you to use before a match.
7. Why is muscular endurance a benefit for invasion sports?
9. What will happen to your body if I keep practising my training?

# Physical Education: Football

## Rules

- **Offside (offence):** when a player goes behind the line of opposing defenders before the ball
- **Handling the ball:** Players are not allowed to use their hands or arms to control the ball unless they are the goalkeeper
- **Throw in:** a throw in occurs when the ball has completely passed the touchline
- **A corner kick** is awarded when the defending team kicks the ball over the goal line
- **A goal kick** is awarded when a ball passes wholly over the goal line, having last touched an attacking team player who has been kicked to them
- **A free kick** is awarded to the opposing team when a player is guilty of an offence
- **A penalty kick** is awarded if a player commits a direct free kick offence inside their penalty area. Goals may be scored directly from a penalty kick.



## Skills & Techniques

Attacking strategies- using the width is very important. If you keep possession and move the ball quickly you can move opponents out of their formations. Another way you can do this is to switch play using a long/lofted pass. To help keep possession some teams use depth in order to build attacks.

Defending- players are normally marked 'man to man' by positional match up. However, you can also zonally mark. When defending it is important to keep a good line to allow you to catch opposition offside.

## Wow Words

Attacking      Balance  
 Coordination Crossing      Defending  
 Offside  
 Dominant/ non-dominant foot  
 Dribble      Free Kick  
 Lofted pass      Penalty Shoot Tackle



## Regulations

- 2 teams, each with a maximum of eleven players; one must be the goalkeeper
- A match is usually played in two halves, lasting up to a maximum of 45 minutes. This depends on your age.
- A kick-off starts both halves or to restart after a goal is scored.
- Each team will play with a set formation, where players have different positions & roles

## Formations





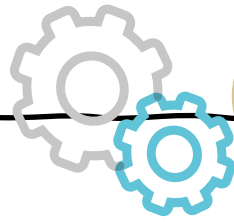
## KNOW IT

### Technical

1. How do I pass effectively?
2. How can I receive the ball?
3. How can I attack space effectively?
4. What methods can I use to score?
5. How do I create space?

### Health, Fitness & Well-Being

6. How can exercise help improve my well-being?
7. How do we warm up?
8. What physical benefits does a warm-up bring?
9. How can I train for invasion sports, like football?
10. What are the principles of training?



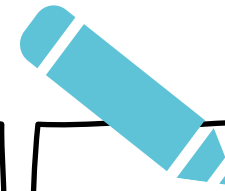
## THINK IT

### Technical

1. What type of pass is most appropriate in small spaces?
2. Describe three things a player should do to show they are ready to receive the ball.
3. Why is attacking space important?
4. Where should you aim when shooting in football?
5. Give an example of creating space for your sport.

### Health, Fitness & Well-Being

6. What benefits do you get out of playing invasion games?
7. What 3 components of a warm-up should be used?
8. How will this develop your body to gain an advantage?
9. How can this be applied to your play?



## GRASP IT

### Technical

1. Why is it important to give a pass appropriate accuracy and power?
2. How can signally be used to receive the ball in a game situation?
3. What are your three main options when you receive the ball in space?
4. Explain 3 ways to score points in rugby.
5. Why is good \_\_\_\_\_ at creating space in the game?

### Health, Fitness & Well-Being

6. How do you think sport will help you at school?
7. Create a warm-up plan for you to use before a competitive match.
8. Why is muscular endurance a benefit for invasion sports?
9. What will happen to my body if I keep overloading my training?



# Physical Education: Netball

## 1. RULES

- **Contact:** You can't touch or push any player during the game as it is a non-contact sport, this will result in a penalty pass or if they contact you whilst you are in the shooting circle, you will get a penalty shot.
- **Footwork:** If the player moves the landing foot or takes 3 steps with the ball, the other team gets a free pass.
- **Obstruction:** You must be 1 metre away from the player you are marking before your arms go up and over the ball. If your defender is obstructing you before you shoot, you get a penalty shot. 3 seconds:
- You can only hold the ball for 3 seconds before you pass or shoot.
- **Centre pass:** To start a game and after a goal is scored you go back to the centre pass and players must receive in the centre third.
- **Repossession:** If a player drops the ball or bounces the ball and picks it back up again the other team gets a free pass.
- **Offside:** If you go into a third that you are not allowed in or if any other player than GS GA GK GD go into the shooting circle the other team gets a free pass.

## 2. COURT & POSITIONS

Netball Positions: (and who they mark)

Goal Shooter- allowed in the shooting third only (GK)

Goal attack- allowed in the shooting and centre third (GD)

Wing attack- allowed in the centre and shooting third but not the circle(WD)

Centre- allowed everywhere except the 2 circles (C)

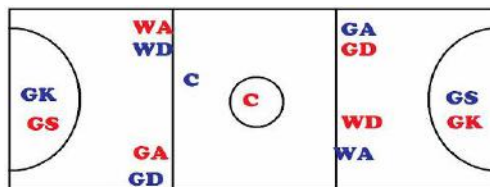
Wing defence - allowed in the centre and defending third but not the circle (WA)

Goal defence- allowed in the defending third and the centre third (GA)

Goal keeper- allowed in the defending third only. (GS)

## 4. REGULATIONS

- 2 teams of 7 players
- A netball court is 30.5m long and 15.25m wide. The longer sides are called the side lines and the shorter sides the goal lines.
- • To score a point the GA or GS must shoot the ball into the net and it must travel all the way through the net.
- • You get 1 point for each goal.
- • Each team take alternate centre passes after a goal.



Blue Team.  
Red Team.



## 3. WOW WORDS

|              |                     |
|--------------|---------------------|
| Passing      | Offside             |
| Contact      | Pivot               |
| Defence      | Replaying the ball  |
| Dodging      | Shoulder pass       |
| Footwork     | Change of direction |
| Held Ball    | Marking             |
| Interception | Obstruction         |
| Landing      |                     |



## 5. EXTRA CURRICULAR ROUTES

Sutton Town Netball Club;  
[SUTTON TOWN home page \(hitsports.com\)](https://www.hitsports.com)  
 Birmingham Netball Association (15+)  
[Senior Clubs - Birmingham Netball](#)  
 Sutton Royals Netball Club  
[Home - Sutton Royals Netball Club](#)  
 Wyndley Netball Club  
[Wyndley - Netball West Midlands](#)



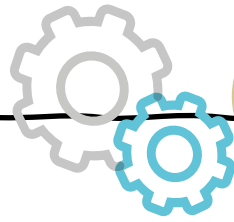
## KNOW IT

### Technical

1. What are the three types of pass?
2. How can I receive the ball?
3. How can I attack space effectively?
4. What players can I use to score?
5. What are the 7 positions in a team?

### Health, Fitness & Well-Being

6. How can running help improve my well-being?
7. How do we warm up for netball?
8. What physical benefits does a warm-up bring?
9. How can I train for invasion sports, like netball?
10. What are the principles of training?



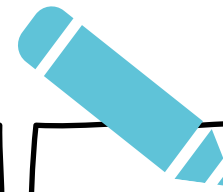
## THINK IT

### Technical

1. When should each type of pass be used?
2. Describe the players positions and what their roles are in the team.
3. Why is attacking space important?
4. What order of play should you go through? Start from the GK. Why?
5. Give an example of creating space for your position.

### Health, Fitness & Well-Being

6. What benefits do you get out of playing invasion games like netball?
7. What 3 components of a warm-up should be used?
8. How will this develop your body to gain an advantage in netball?
9. How can this be applied to your game?
10. What is your favourite position & why?



## GRASP IT

### Technical

1. Why is it important to give a pass appropriate accuracy and power?
2. How can footwork & pivoting help receive the ball in a game situation?
3. Who restarts from a centre pass? How do you know?
4. Explain what is meant by the term replaying/repossession
5. Why do GS need to be good creating space in the game?

### Health, Fitness & Well-Being

6. How do you think this sport will help you at school?
7. Create a warm-up plan for you to use before a competitive match.
8. Why is muscular endurance a benefit for invasion sports?
9. What will happen to your understanding if you play in all the different positions?



# Religious Education: Ethics

## 1. Prejudice and Discrimination.

### Reasons people are prejudice:

Children whose parents are prejudiced may grow up hearing racist or sexist comments and are likely to imitate them in later life.

A bad experience can affect peoples expectations of others.

The media is an important influence that can reinforce stereotypes, but it can also be a means of breaking them down too.

## 2. Anti-Racism.

**“He who passively accepts evil is as much involved in it as he who helps to perpetrate it.” – Martin Luther King Jr.**



Dr King won the Nobel Peace Prize in 1964 after leading Civil Rights activists from all over the USA to Washington to see the law changed to make anti-black segregation illegal. He was murdered in Memphis aged 39 in 1969. His powerful speeches could move crowds of many thousands. His work was inspired by his Christian faith and Christian teachings on compassion.

## 3. Gender.

There are differing beliefs about Gender roles within religion.

### Christian beliefs

- All people are created equal in the image of God (Genesis 1:27).
- Paul, an early follower of Jesus, taught that everyone is equal regardless of race, gender or social class. However, he also teaches that husbands should rule over their wives and women should obey their husbands.

### Muslim beliefs

- God created all people equal, from a single soul and with the same spiritual human nature (Quran 49:13).
- Islamic law recognises the full property rights of women before and after marriage. A wife can keep her maiden name and be financially supported.

## 4. WOW WORDS

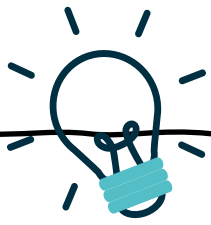
**Prejudice:** a preconceived opinion or bias. To cause harm to someone based upon this preconceived idea.

**Discrimination:** unfair treatment based upon prejudice especially regarding race, religion or colour of skin.

## 5. Stewardship

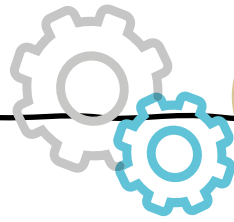
Muslims believe that they have been given the role of **Khalifah** which means that Allah gave the planet to human beings for them to look after and to be its guardians. Muslims must use their skills to look after the environment and not pollute or damage it.

On the day of judgement God will ask how Muslims have faced their responsibility towards the earth, the creatures on it and the natural resources that Allah gave them to use.



## KNOW IT

1. What are the common reasons why people are prejudice?
2. Who was Martin Luther King Jr, and what inspired his anti-racist work?
3. Are all beliefs about gender roles the same within religion?
4. What is one religious quote from sacred text that supports gender equality?
5. What is the difference between prejudice and discrimination?
6. What is a Khalifa?
7. Why are Muslims expected to take care of the earth?

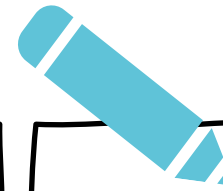


## THINK IT

What are the potential effects of prejudice?

Do men and women have equal rights within religion?

Should all places of worship become eco-friendly?



## GRASP IT

Using the case study of the 'Cambridge Eco-Mosque', explain if and why all mosques should become eco friendly.

*'Europe's first eco-mosque is committed to sustainability and looking after the environment. The mosques eco-design adds zero pollution and reminds the visitors to connect with nature. Worshippers enter the Mosque through a quiet garden that is open to everyone, and was designed based on the Paradise Gardens described in the Qur'an.*

*The building is naturally lit all year round by large skylights in the roof, low energy lightbulbs, and solar panels on the roof, to help generate renewable energy from sunlight. Outside the Mosque there is space for bikes and it is a short walk away from the city, meaning that people can choose more eco-friendly ways of transport to get to the mosque.'*



# Science: Forces

## 1. Calculations

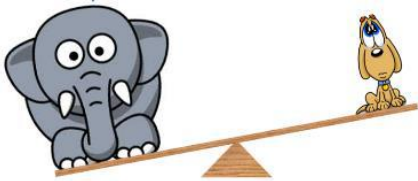
Force can be calculated and put into this equation by using:

$$\text{Weight(N)} = \text{mass (Kg)} \times \text{gravity(N/Kg)}$$



$$\text{Work done (J)} = \text{force (N)} \times \text{distance (m)}$$

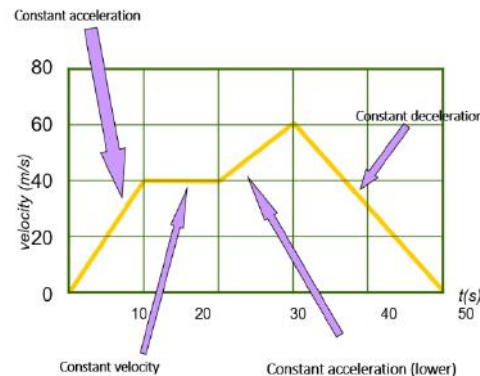
## 4. Moments



Increasing the force or distance increases a moment.

$$\text{Moment (Nm)} = \text{force(N)} \times \text{distance (m)}$$

## 2. Velocity time graphs



The acceleration can be calculated on a velocity-time graph by working out the gradient of the line:

$$\text{Change in Y} \div \text{change in X}$$

## 5. Newtons 3 Laws

Newton's first law, an object will not change its velocity or direction unless a force acts on it.

Newton's second law, the bigger the force, the greater the acceleration. The smaller the mass the greater the acceleration

Newton's third law, when two objects interact, they apply forces to each other of equal magnitude and opposite direction

## 3. Key Words

**Work-** When an object transfers energy it does work. Work is measured in J or Nm

**Pressure** – The force on an object by something in contact with it.

**Moment-** A turning effect produced by a force acting at a distance on an object.

**Braking distance** – The distance a vehicle travels after the brake pedal has been pressed. It is affected by mass, speed and brake/tyre condition.

**Stopping distance** – Thinking distance + the braking distance. It is affected by the combined factors of braking distance and thinking distance.

**Thinking distance** – The distance a vehicle travels whilst the driver reacts. It is affected by alcohol, distractions such as phones, poor visibility and speed.

**Velocity-** Speed in a given direction (a vector)

**Law** – A scientific phenomenon always occurs if certain conditions are present



## KNOW IT

Define thinking distance.

Define braking distance.

Define stopping distance

What is the equation to calculate work?

What is the equation to calculate moments?

What is the equation to calculate pressure?

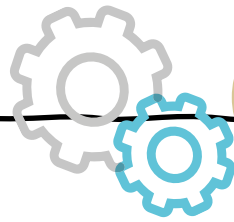
What are the units for pressure?

What is Newton's first law?

What is Newton's second law?

What is Newton's third law?

Total score



## THINK IT

How do you calculate the gradient of a line?

What factors affect braking distance?

What factors affect thinking distance?

Define moment

Define work

Define pressure

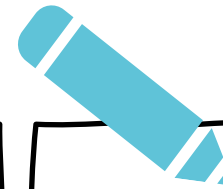
What factor affects both thinking distance and braking distance?

How is the gradient of a line calculated?

What does a horizontal line show on a velocity-time graph?

How is this different in a distance-time graph?

Total score



## GRASP IT

What is the rearranged equation to calculate spring constant?

How do you calculate the work done when you are given the mass instead of the force?

How does the graph show that force and extension are directly proportional?

Why do spacecraft need to have strong hulls?

Why do submarines need to have strong hulls?

Write a paragraph comparing speed and velocity time graphs.

What is the difference between speed and velocity?

Total score

# Science: Atoms and Bonding

## Part 1

Year

9  
KO

### Ionic bonding

When a metal and a non-metal react together, the metal atom loses electrons and becomes a positive ion. The non-metal atom gains electrons and becomes a negative ion. The ionic bond is a strong electrostatic force of attraction between these oppositely charged ions. High melting point and boiling points. Because it takes a lot of energy to overcome the many strong ionic bonds in the lattice. There is a strong electrostatic force between the positive and negative ions in the giant lattice. Conduct electricity when liquid/ molten. Ions are able to move so there is a flow of charged ions (current). Do not conduct electricity when solid. Ions are in fixed positions so cannot flow.

### Metallic bonding

Remember metals lose electrons to form positive ions. Metallic bonding is formed between metal ions to form giant structures of atoms to form a regular pattern. The electrons in the outer shell become delocalised and can move through the structure. The forces of electrostatic attraction between positive and negative ions are what holds the metal structure together. Metals have high melting and boiling points. They are good conductors of heat and electricity. As the free electrons carry the charge through the metal.

### Covalent bonding

A covalent bond is formed when a pair of electrons are shared. They occur between non-metal atoms and form strong bonds. There are different ways to represent covalent bonding, but they all have their limitations. Simple molecules are joined by a few atoms and giant covalent structures are made from many atoms sharing electrons. Simple covalent structures are small molecules that have low melting and boiling points. This is because the intermolecular forces between molecules are weak. When energy is supplied the forces are easily overcome. The bigger the molecule the higher the melting and boiling point because the amount of forces increases with the size of the molecule. Therefore, they require more energy to break the forces. They cannot conduct electricity because they share electrons and have no overall charges.

### Giant carbon compounds

Giant covalent compounds have high melting and boiling points because all of the atoms form strong covalent bonds. Diamond is hard because each carbon is bonded to 4 other carbons. There are no free electrons so cannot conduct electricity. Graphite can conduct electricity because it is only bonded to 3 other carbon atoms so it has free electrons that can carry thermal energy and electric charges through it. The bonding in graphite means sheets of carbon atoms form layers in a hexagon shape. There are no forces between the layers which means they are soft and slippery and ideal as a lubricating material. Graphene is strong, light and made of a single layer of graphite. It has free electrons so is a good conductor of thermal energy and electricity so is used in small electric circuits such as mobile phones. Fullerenes are hollow molecules made from carbon and shaped like balls or tubes. They have a large surface area so are made good catalysts and are used to deliver drugs to where it is needed in the body.

### Key Words

**Ion** A charged particle formed when atoms lose or gain electrons.  
**Ionic bond** An electrostatic attraction between two oppositely charged ions (metal and non-metal).  
**Electrostatic attraction** The attraction between a negatively charged particle and a positively charged particle.  
**Metals** In ionic bonding, metals lose electrons to become positively charged ions.  
**Non-metals** In ionic bonding, non-metals gain electrons to become negatively charged ions.  
**Giant lattice** A large regular 3D structure that contains millions of bonds.  
**Covalent bond** A bond formed when non-metals share electrons. An electrostatic attraction between the positively charged nuclei of the bonded atoms and the electrons shared between them.  
**Molecule** A small group of atoms held together with covalent bonds. Not charged.  
**Polymer** Very large covalently bonded molecules with many repeating units.  
**Metallic bonding** The bonding of a metal consists of a lattice of positive ions surrounded by a sea of delocalised electrons.  
**Alloy** A mixture of two or more elements, at least one of which is a metal.

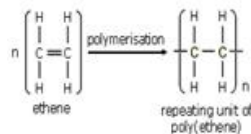
# Science: Atoms and Bonding

## Part 2

### Polymers

Polymers consist of thousands of small molecules called monomers that join together. It is difficult to draw lots of monomers so we represent them using a repeating unit.

Most polymers are solid at room temperature, however the intermolecular forces in polymers are weaker than in ionic or covalent bonds so have lower melting and boiling points



### Tests for gases

| Gas            | Procedure                | Result               |
|----------------|--------------------------|----------------------|
| Oxygen         | Insert a glowing splint  | Splint relights      |
| Hydrogen       | Insert lit splint        | Squeaky pop          |
| Carbon dioxide | Bubble through limewater | Limewater goes milky |
| Chlorine       | Damp litmus paper        | Bleaches white       |

### Formulations

Formulations are important in the pharmaceutical industry and are made by mixing the components in carefully measured quantities to ensure that the product has the required properties.

When you buy a product, the ratio or percentage of each component is found on the packaging. This is its formulation.

Depending on the purpose of the product, the amount and type of chemicals used will be changed to make sure it is right for the job. E.g. Pigment of paint., medication and jewellery

### Chromatography

Chromatography is a physical method that is good for separating and identifying things. Chromatography always involves two phases, a mobile phase and a stationary phase.

In paper chromatography, the mobile phase is the solvent, the stationary phase is the paper.

During chromatography, the substances in the sample constantly move between the mobile and the stationary phase – an equilibrium is formed between the two phases.

A substance which has stronger attraction to the stationary phase will not move very far up the paper in the same time.

A substance which has stronger attraction (solubility) to the mobile phase will spend more time in the mobile phase and hence move further up the paper.

Different compounds have different R<sub>f</sub> values in different solvents, which can be used to help identify the compounds.

Explaining how different dyes are separated using paper chromatography: Solvent (mobile phase) moves through the paper (stationary phase).

Different dyes have different solubilities in solvent and different attractions for the paper and hence are carried different distances.

### States of matter

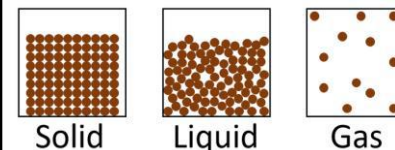
Materials come in 3 different forms: solid, liquid and gas. The forces of attraction between the particles determine the state. The strength of forces between particles is determined by the type of bonding, temperature and pressure.

Particle theory explains how particles behave in the 3 states of matter.

Limitations of the particle model:

The particles are not solid or spheres, they are atoms, ions or molecules  
It doesn't show the forces between the particles

The size and distance between particles are not to scale.



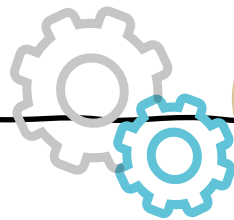
Solid particles are in a regular arrangement touching each other  
Liquid particles can move over each other but there is not much space between them

Gas particles are far away from each other and move randomly



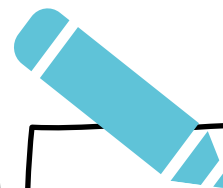
## KNOW IT

1. What is the definition for a positive ion?
2. What is the definition for a negative ion?
3. Draw a carbon atom.
4. Describe 3 differences between covalent bonding and ionic bonding.
5. What type of forces hold the particles together in metals and ionic compounds?
6. What are polymers?
7. What is an aqueous solution?
8. Describe what covalent bonding is.
9. Describe what ionic bonding is.
10. State the properties of ionic compounds.



## THINK IT

1. Describe what an allotrope is and give examples.
2. Explain how  $\text{CO}_2$  is formed.
3. Describe the differences between a pure metal and an alloy.
4. Explain what metallic bonding is and give their properties.
5. Draw the displayed formula for water and oxygen.
6. Explain the properties of giant covalent structures.
7. Explain the difference between graphite and diamond.
8. Polymers are giant covalent structures. Explain why they have a lower melting and boiling point than diamond or graphite.
9. Explain the structure of a giant ionic lattice and give their properties.
10. Explain what fullerenes are and give some examples.



## GRASP IT

1. Compare the differences between how hot water and salt are formed.
2. Explain the difference between giant covalent bonds and simple covalent bonds.
3. Compare the properties of simple covalent structures and giant covalent structures.
4. Compare the difference between water and hydrogen.
5. Draw a dot and cross diagram for carbon dioxide.
6. Draw a repeating unit for ethene if its formula is  $\text{C}_2\text{H}_4$
7. Draw a diagram and explain how  $\text{NaCl}$  is formed.
8. Explain what nanoparticles are and describe their properties
9. Explain the uses of nanoparticles.
10. Explain why nanoparticles have a high surface area to volume ration.

# Science: Cells

## 1. Microscopes

Microscopes are used to view cells close up.

1. Move the stage down to its lowest position.
2. Place the glass slide onto the stage.
3. Select the lowest power objective lens.
4. Turn the coarse focus knob slowly until you are able to see the cells.
5. Turn the fine focus knob slowly until the cells are in focus and you can see them clearly.
6. Repeat steps 1-5 using the higher power magnification to see the cells in more detail

Total magnification = eye piece lens magnification × objective lens magnification

## 2. Prokaryotic and eukaryotic cells

| Structure     | Function  | Animal Cells | Plant Cells | Bacterial Cells |
|---------------|---|--------------|-------------|-----------------|
| Nucleus       | Contains the <b>genetic information</b> that controls the functions of the cell.        | Y            | Y           |                 |
| Cell Membrane | Controls what <b>enters &amp; leaves</b> the cell.                                      | Y            | Y           | Y               |
| Cytoplasm     | Where many cell activities & reactions happen.  | Y            | Y           | Y               |
| Mitochondria  | Provides energy from <b>aerobic respiration</b> .                                       | Y            | Y           |                 |
| Ribosomes     | Make proteins- site of <b>protein synthesis</b> .                                       | Y            | Y           | Y               |
| Chloroplast   | Where <b>photosynthesis</b> occurs.   |              | Y           |                 |
| Vacuole       | Use to store water & other chemicals as <b>cell sap</b> .                               |              | Y           |                 |
| Cell Wall     | <b>Strengthens &amp; supports</b> the cell (made of cellulose in plants)                |              | Y           | Y               |
| DNA Loop      | A loop of DNA <b>NOT</b> in a nucleus.  |              |             | Y               |
| Plasmid       | A <b>small circle of DNA</b> , may contain genes associated with antibiotic resistance. |              |             | Y               |

## 3. WOW WORDS

**Cell**- The building blocks of living organisms

**Tissue**- Groups of similar cells working together eg muscles and bones

**Organ**- A group of different tissues that work together eg the heart

**Organ system**- A group of organs that work together eg the digestive system

**Unicellular organisms**- Organisms made of only one cell eg bacteria.

## 4. Specialised cells

| Specialised Cell | How structure relates to function  |
|------------------|--|
| Sperm Cell       | Acrosome contains enzyme to break into egg, tail to swim. Many mitochondria to provide energy.   |
| Nerve Cell       | Long to transmit electrical impulses across a distance.  |
| Muscle Cell      | Contain protein fibres that contract when energy is available, making the cells shorter.   |
| Root Hair Cell   | Long extension to provide a large surface area for water & mineral absorption- thin cell wall.   |
| Xylem Cell       | Waterproofed cell wall, cells are hollow to allow water through.   |
| Phloem Cell      | Some cells have a lot of mitochondria to give energy for active transport. Some cells have little cytoplasm for sugars to move through easily. |

## 5. Enzymes

Enzymes are biological catalysts which speed up reactions including digestion. They have a specific shape. This fits into the molecule it will break or join together. This is the active site. The molecules that are broken and made are called substrates. The way they fit together is called the 'lock and key model'. If enzymes are heated too much or put into a higher or lower pH, their shape can change. The enzyme undertakes a process of denaturation, meaning it will not fit its substrate or substrates. The enzyme cannot speed up the reaction anymore.

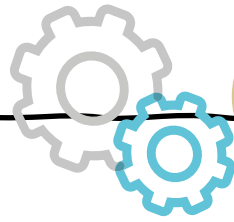
## 6. Movement in and out of cells

|                         |  |
|-------------------------|--|
| <b>Diffusion</b>        | Movement of <b>particles</b> from an area of high concentration to an area of low <b>concentration</b> . No energy required  |
| <b>Osmosis</b>          | Movement of water molecules across a partially permeable membrane from a region of high water concentration to a region of low water concentration. No energy required |
| <b>Active Transport</b> | Movement of particles against a concentration gradient (low to high). Requires energy  |



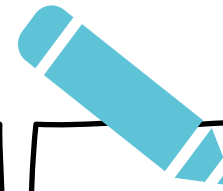
## KNOW IT

1. What are cells
2. Describe the function of Nucleus, Cytoplasm and cell wall?
3. Identify the structures that are found in plant cells but not animal cells
4. Identify what a specialist cell is?
5. What is the importance of the cell cycle?
6. What are stem cells?
7. What is diffusion?
8. What is osmosis?
9. What is active transport?
10. Name two substances that are exchanged in cells



## THINK IT

1. Draw a plant and animal cell, label it and describe the function of the structures
2. Explain the difference between bacterial cells and animals cells
3. Explain what specialised cells?
4. Explain the function of the following Cells and explain how they have adapted to carry out their function:  
Sperm Cell, Nerve Cell and Red blood Cell.
5. Describe the two stages of the life cycle
6. Describe where stem cells are found
7. Sketch a diagram to illustrate how diffusion works
8. Describe the difference between osmosis and diffusion
9. Describe the difference between osmosis, diffusion and active transport
10. Describe how the surface area to volume ratio can affect the exchange of substances



## GRASP IT

1. Explain the difference between Prokaryotes and Eukaryotic Cells?
2. Compare the difference between prokaryotic and Eukaryotic cells?
3. Compare the function and adaptations of root hair cells, phloem and xylem?
4. Explain a method to observe cells under a microscope
5. Explain what happens during the second stage of the cell cycle
6. Explain why stem cells are beneficial/useful
7. Give 2 examples of the importance of diffusion in animals and/or plants
8. Describe the process of osmosis in plants and explain its importance
9. Describe an example of active transport in animals and explain its importance
10. Explain how the lungs and small intestine are adapted for efficient exchange of substances

# Design & Technology: LED Lamp

## 1. Materials

All **materials** have **physical** and **working** properties. Physical properties are the traits a material has **before** it is **used**, **working properties** are how a material behaves when it is **manipulated**.

**Timber** comes from trees, which have to grow to full maturity before they can be cut down for wood. Timbers can be split into two categories: **softwoods** and **hardwoods**.

**Manufactured boards** are usually made from timber waste and **adhesive**.

**Metals** are found **naturally** and are **mined** from the **earth**. They can be split into **ferrous**, **non-ferrous** or **alloys**.

## 4. ACCESS FMM

**Aesthetics** – the **appearance/look/feel**.

**Cost**- the **price** the product will be **made** and **sold** for to suit the needs of a **client**.

**Client**- **who** is the product designed for?

**Environment**- **where** the product will be **used**, Indoors/outdoors? **Sustainability**.

**Size**- What are the **dimensions**?

**Safety**- How has it been made **safe** to **use**?

**Function** – the intended **purpose** of the product, is it **multifunctional**?

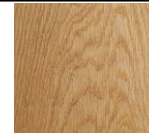
**Materials**- What is it **made** out of? **Why**?

**Manufacture**- How was the product **made**?

**CAD/CAM**, by **hand**, **why**?

## 2. Timber

**Hardwood: Oak:** strong, heavy, durable, hard and tough. Finishes well. Has an attractive grain and is often used in flooring and high-quality furniture. Very expensive.



**Softwood: Scots Pine:** Light brown/yellow in colour. Straight-grained but knotty, fairly strong and easy to work with and paint, cheap. Used in general construction work and joinery.



### **Manufactured Board: Plywood**

Reddish brown or white in colour.

Layered in odd numbered sheets.

Strong due to layers glued at 90°

angles (cross-directional strength).

Susceptible to splintering Used in sheds and cladding, furniture, flooring, boats (marine ply). The Forest Stewardship Council (**FSC**) is an organization that

promotes **responsible management** of the world's **forests**, for every tree cut down, one is planted.



## 5. Metal

**Ferrous** metals contain iron and are **magnetic**. They are prone to **rust** and therefore require a protective finish.

**Non-ferrous** metals do not contain iron and are not magnetic. They do not rust.



### **Copper – Non-ferrous metal**

Bright, decorative colour when polished.

Corrosion resistant. Soft and easy to work with by hand (malleable and ductile). Excellent conductor of electricity.

## 3. WOW WORDS

**Source/origin** = where a material comes from.  
**LED** = Light emitting diode.

**Prototype** = The first working model of a design used for testing, development and evaluation.

**Breadboard** = A prototyping base for electronics to check the circuit works before making the circuit permanent.

**Malleable** = Can be deformed, rolled or pressed into a sheet without breaking.

**Ductile** = Can be drawn into wires.

**Conductor** = allows heat and electricity to pass through it easily.

**Hardwood** = Timber from a deciduous tree. They are slower growing and more expensive.

**Softwood** = Timber from an evergreen or coniferous tree. Fast growing.

## 6. Equipment

**Soldering Iron** - a hand tool which supplies heat to melt solder to join two workpieces.



**Soldering iron stand** - used to keep the hot soldering iron away from you and the work area.



**Solder** – a fusible metal alloy used to create a bond between metal workpieces.







## KNOW IT

ACCESS FM is used to help up to analyse products. (Aesthetics, cost, client, environment, size, safety, function, materials, manufacture).

### How to describe a product:

What is it made from? Who is it for? When would it be used? Where is it used? How much does it cost? How has it been made?

### Comprehensive – Critical analysis of a product:

Do I like it? If so, why/why not?

Does the theme/style suit the target market?

Is it the right size, shape, pattern, colour?

Is it strong and sturdy?

Is it safe to use?

### Demonstrate how the product is used:

Explain why a product was developed.

Explain the purpose of different features of the product.

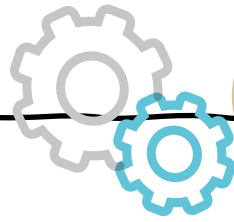
A Design Brief is a short statement of what is required in a design.

Modelling is a representation of a design made from disposable materials (cardboard/paper).

Analysis is reflecting on your designs/ product and assessing its strengths and weaknesses.

Annotation is labels that are attached to design work to explain your ideas further.

Ergonomics is how comfortable/ easy a design is to use and how well it meets the users needs.



## THINK IT

### How to interpret products that are new:

What is my reaction to this product?

Who might the user or owner be?

Why might they want to buy it?

Is it designed well, if so, why/why not?

Is it easy to use?

How well is it made?

Is it well finished(polished, sanded, varnished)?

Is the cost appropriate?

What happens at the end of its product life?

(recycled, landfill, can it be repaired/ reused)

### Analysis – breaking down into parts, forms:

What assumptions have been made about the people who might use the product?

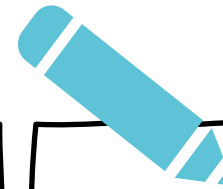
Consider inclusive design, have all potential users been considered?

What make this product distinct from others of its type?

### Consider the environmental impact of designers:

When designing and manufacturing a product, it is important to consider its life cycle.

Life cycle is the time from a products manufacture, to its recycling or disposal, at the end of its useful life. We need to consider the 6 R's: Reduce, reuse, recycle, refuse, repair and rethink.



## GRASP IT

### Synthesis – combining elements into a pattern:

Would I want to own or use it?

What influenced the appearance and the way it works?

How might the design have been developed?

How would you test this to see..?

Could you redesign to improve a part of the design?

What innovation techniques could you use to improve it? Biomimicry?

### Evaluation – according to criteria and state:

What is wrong with the product?

Why is this product more or less popular than other similar products?

What difficulties would manufactures have making this product?

Why have these materials been chosen?

Could you analyse the lifecycle of an existing product and advise opportunities where designers could make it more sustainable by using the 6 r's?

Could you communicate a design idea showing improvements using a technical drawing style?

Could you annotate your drawing to show key parts?