



Name .....

Set .....

## **Year 8 Knowledge Organiser Term 1 and 2**

### **Assessment dates:**

Practical Assessment 1 October 2027 Your practical assessment will be to outline the method to make a salt from a metal carbonate.

End of Term Written Assessment December 2027 This will look at all the topics you have completed this term.

### **Important Dates This Term**

Pasteur Day 28<sup>th</sup> September

Curie Day 7<sup>th</sup> November

# Topics Covered this term



Tissues and Organs – You will also be able to name different organ systems of the human body, you will also be able to describe the adaptations of the lungs and how they aid gas exchange.



Acids and Alkalis – You will be learning about the differences between acids and alkalis, how to test for them and the process of neutralisation. Including how to name different salts.



Speed – You will learn how to calculate speed, draw distance time graphs and the uses of pressure for example in brakes of a car or bike.



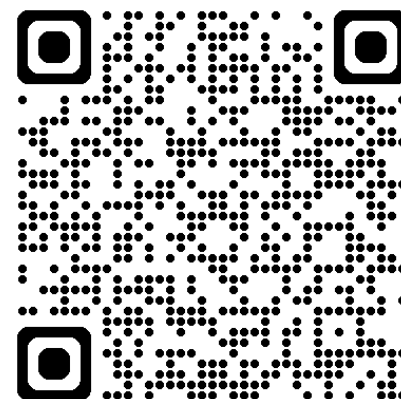
Respiration and Photosynthesis – You will learn about how plants produce glucose by photosynthesis and how both plants and animals use this glucose for respiration.

You will also investigate factors which affect the rate of photosynthesis.



## Homework

Home Learning is seen to make an important contribution to pupils' progress at school and can ensure that teaching time is used to maximum effect. You will be set homework every Wednesday on GCSEpod the QR code will take you there. The expectation is that your homework will take you 10 minutes per week. Consolidating and revisiting the weeks learning



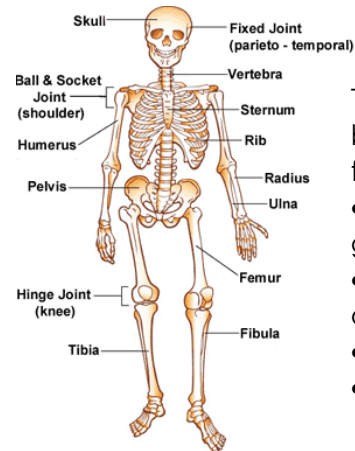
***'Putting Every Student on the Path to a Happy, Successful and Fulfilling Life'***

## Week 1

### Big Picture: Tissues and Organs

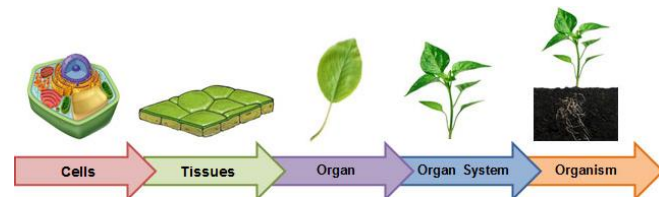
The musculoskeletal system is made up of bones, muscles and other connective tissue.

Red and white blood cells are produced in the bone marrow of flat bones such as the **pelvis**.



The skeleton is made up of bones. It has 4 important functions:

- to **support** the body and give it shape
- to **protect** the internal organs
- to allow body **movements**
- to produce **blood cells**

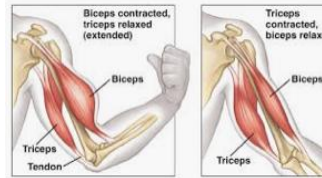


## Week 2

### Big Picture: Tissues and Organs

The function of muscles is to allow movement by **contracting**. **Antagonistic muscles** work in pairs.

An example of antagonistic muscles is the **biceps** and **triceps**.

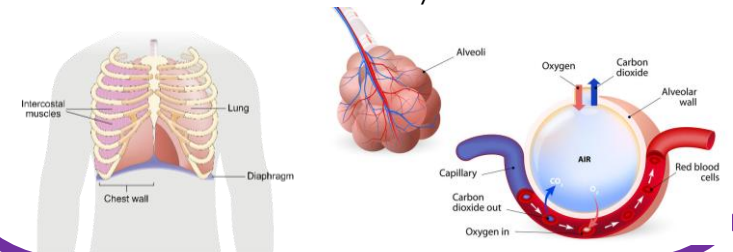


**Joints** occur where two or more bones join together. **Cartilage** in joints prevents bones rubbing together. An **organ** is made up of different tissues that work together to perform a certain function. We can use the **force applied** as a measurement of **muscle strength**. A **Newtonmeter** can be used to measure the force exerted by a muscle.

## Week 3

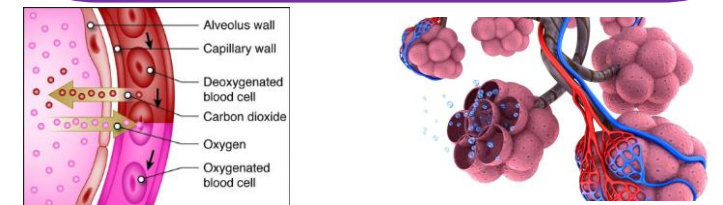
### Big Picture: Tissues and Organs

The **respiratory system** is made of the organs involved in gas exchange. Breathing occurs through the action of muscles (intercostal muscles) in the **ribcage** and **diaphragm** (below the lungs) that change the size of the chest cavity. Air enters the body through the **nose** and **mouth**. It then travels down the **windpipe (trachea)**, through a **bronchus** then a **bronchiole** into an **alveolus**. Oxygen diffuses into the blood at the alveoli, which are microscopic air pockets in the lungs lined with cells that form a very thin membrane.



## Year 8 Science: Term 1

### Tissues and Organs, Acids and Alkalis

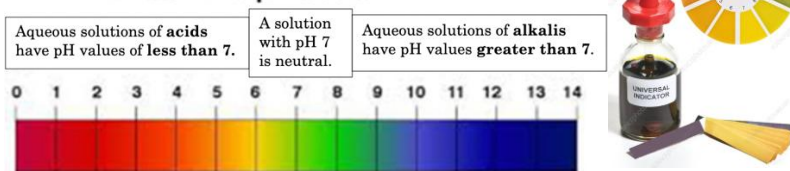


## Week 4

### Big Picture: Acids and Alkalis

Substances can be classified into **acidic**, **alkaline** and **neutral** solutions. The pH scale, from **0 to 14**, is a measure of the acidity or alkalinity of a solution and can be measured using litmus, universal indicator or a pH probe. A solution with pH 7 is neutral, acids have pH values of less than 7, alkalis have pH values greater than 7. **Acids** will turn universal indicator **red or orange**.

#### The pH Scale



## Week 5 & 6

### Big Picture: Acids and Alkalis

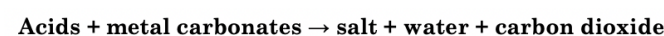
**Neutral** solutions will turn universal indicator **green**. **Alkaline** solutions will turn universal indicator **blue or purple**.

In neutralisation reactions an acid reacts with an alkali to form a salt and water. Neutralisation forms a neutral (pH7) solution. A salt is a metal compound made from acid. A salt is formed when the hydrogen in an acid is replaced by a metal.



Acronym: **A** + **A/B** → **S** + **W**

Metal carbonates react with acids in neutralisation reactions to form a salt, water and carbon dioxide.



Acronym: **A** + **C** → **S** + **W** + **C**

## Key words:

**Cilia** - Microscopic hairs that line the inside of the trachea and bronchi

**Trachea** - A tube that carries air from the mouth and nose, to and from the lungs. (Also called the windpipe)

**Contract** - To become smaller

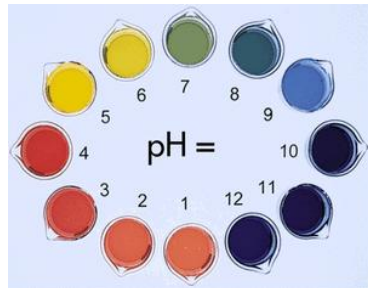
**Hydrochloric Acid** - A type of acid often used in school experiments. Its formula is HCl.

**Salt** - A substance produced by the reaction of a metal and an acid

**Universal Indicator** - A substance that changes colour to show the pH of a solution and can be in liquid solution or paper form

## Week 1

| Questions                             | Answers                                                                                                                                                                                                                      |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What is the function of the skeleton? | <ul style="list-style-type: none"> <li>to <b>support</b> the body and give it shape</li> <li>to <b>protect</b> the internal organs</li> <li>to allow body <b>movements</b></li> <li>to produce <b>blood cells</b></li> </ul> |
| Where are white blood cells produced? | In the bone marrow or flat bones                                                                                                                                                                                             |
| What is a bone?                       | Hard structures made from living tissue with a blood supply,                                                                                                                                                                 |
| Why do you have a skull?              | To protect the brain from damage.                                                                                                                                                                                            |
| What allows bones to move?            | Antagonistic muscle pairs                                                                                                                                                                                                    |

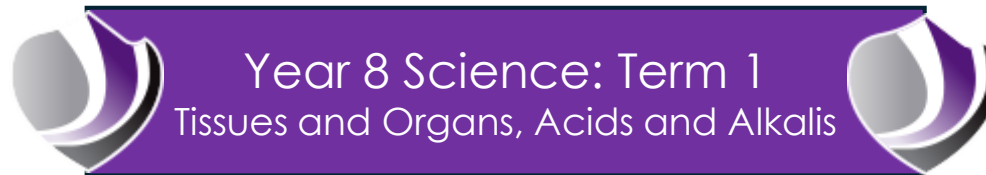


## Week 4

| Questions                                      | Answers                                                       |
|------------------------------------------------|---------------------------------------------------------------|
| What is an indicator?                          | Something with changes colour when added to an acid or alkali |
| Name two indicators                            | Universal indicator and Litmus Paper                          |
| Define the term corrosive?                     | Breaks something down on contact with it.                     |
| Universal indicator turns yellow, suggest a pH | 5 or 6                                                        |
| Why can't litmus blue test alkalis             | Litmus blue only tests for acids.                             |

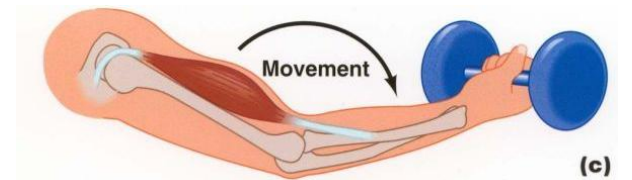
## Week 2

| Questions                                 | Answers                                                        |
|-------------------------------------------|----------------------------------------------------------------|
| Why are muscles tissues?                  | They are made up from the same type of cell with one function. |
| Where do you find joints?                 | Where two or more bones join together                          |
| Antagonistic pair means?                  | Two muscles which work together to cause movement.             |
| Why does the heart contain muscle tissue? | To allow the heart to beat.                                    |
| What does a muscle do?                    | Muscles contract causing movement.                             |



## Week 3

| Questions                                  | Answers                                                               |
|--------------------------------------------|-----------------------------------------------------------------------|
| How are the alveoli adapted for diffusion? | Large surface area, close to blood supply, thin cell walls.           |
| Name the muscles in the ribcage            | Intercostal muscles and diaphragm                                     |
| How can muscle strength be measured?       | Pulling on a newton meter can allow muscle strength to be measured.   |
| What is ventilation?                       | When you take air into the lungs.                                     |
| Define an organ                            | Group of different tissues which come together to perform a function. |



## Week 5 & 6

| Questions                                           | Answers                                         |
|-----------------------------------------------------|-------------------------------------------------|
| How can you make sodium chloride?                   | React Sodium with hydrochloric acid.            |
| What is a salt?                                     | Where a metal compound has reacted with an acid |
| What colour with a salt turn universal indicator?   | Green all salts have a pH of 7                  |
| What colour would pH 14 be                          | purple                                          |
| What is the difference between a base and an alkali | Alkalis are soluble (can be dissolved in water) |

## Key words:

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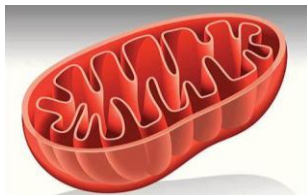
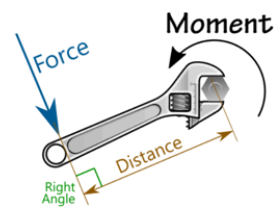
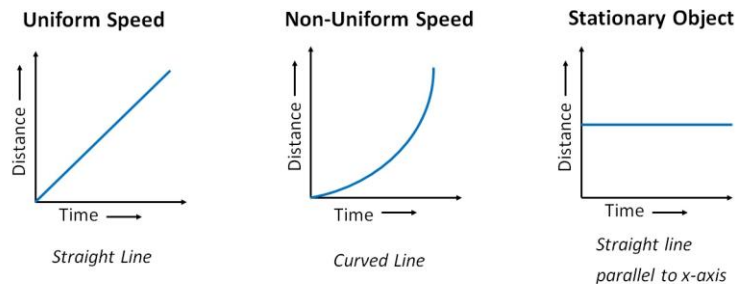
## Week 1

### Big Picture – Motion

A distance time graph can be used to describe the motion of an object. If the graph curved then the object is accelerating

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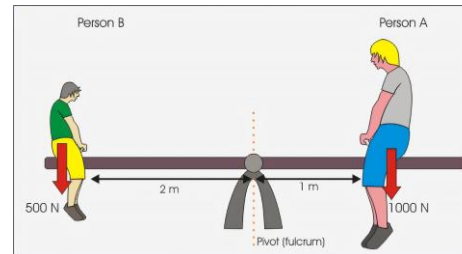
#### Distance-Time Graph Summary



## Week 2

### Big Picture – Motion

A moment is a turning force around a pivot point. A see saw or swings are examples of moments. Two things affect a moment the force you exert and the distance from the pivot.



The direction of movement is either clockwise or anticlockwise. If you look above person A is heavier than person B. The moments are balanced because Person A is further away. You may have done this yourselves in the past

## Week 3

### Big Picture – Respiration and Photosynthesis

Respiration is how an organism is supplied with energy. There are two types of respiration Aerobic and Anaerobic.

#### Aerobic Respiration (with Oxygen)

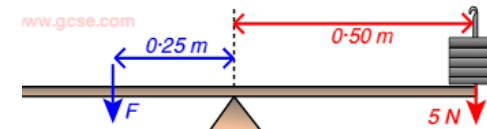
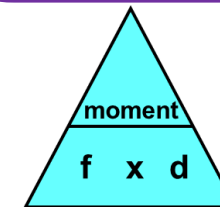
Glucose + oxygen → Carbon Dioxide + Water  
This causes the release of energy and takes place in the mitochondria

#### Anaerobic Respiration (without oxygen)

This is done when your body does not have sufficient oxygen it takes place in the cytoplasm

Glucose → Lactic acid

## Year 8 Science: Term 1 Motion, Respiration and photosynthesis



## Week 4

### Big Picture – Respiration and Photosynthesis

Anaerobic respiration is used when the body requires more energy than what can be supplied solely by aerobic respiration.

Both types will happen at the same time, anaerobic respiration produces lactic acid which is toxic. Over time this will cause muscles to cramp up and stop functioning.

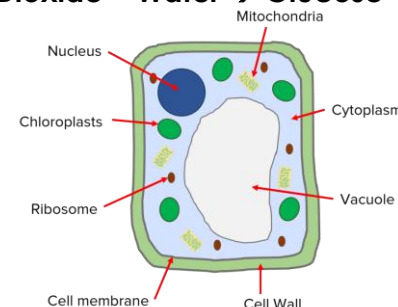
Once you have stopped exercising your body will break down this lactic acid by breathing heavily. This is known as an oxygen debt

## Week 5

### Big Picture – Respiration and Photosynthesis

All living organisms respire. For this they need glucose. This is made in producers (green plants) This glucose is made by photosynthesis which happens in the chloroplasts. This process requires light energy

**Carbon Dioxide + Water → Glucose + Oxygen**



## Key words:

**Aerobic** – Respiration with oxygen

**Anaerobic** – Respiration without oxygen

**Chloroplast** – Part of plant cell which contains chlorophyll which is needed for photosynthesis

**Distance time Graph** – A graph which shows motion of an object

**Lactic Acid** – Byproduct of anaerobic respiration causes muscle cramps

**Moment** – A force caused by turning an object around a pivot such as a door handle.

**Photosynthesis** – Chemical process which produced Glucose in plant

## Week 1

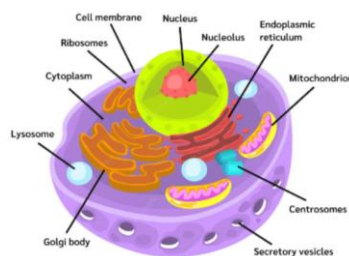
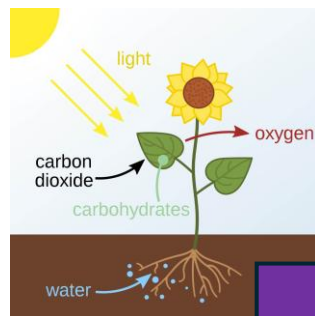
| Questions                              | Answers                              |
|----------------------------------------|--------------------------------------|
| Horizontal line means?                 | The object is stationary             |
| A distance time graph shows            | The motion of an object              |
| Why would the line go down diagonally? | The object is moving backwards       |
| How is acceleration shown?             | The graph will have a curve in it    |
| How is constant speed shown            | The line will be straight diagonally |

## Week 2

| Questions                                                                             | Answers                                                       |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Why do cars have big steering wheels?                                                 | To create a large moment without needing a large force        |
| Define a moment                                                                       | A moment is a turning force around a fixed point (pivot)      |
| What two things affect a moment?                                                      | The force on the object and distance from the pivot           |
| The two directions of a moment are                                                    | Clockwise and anticlockwise                                   |
| You push a steering wheel with 5N and you are 0.6m from the pivot what is the moment? | Moment = Force X Distance<br>Moment = 5 X 0.6<br>Moment = 3Nm |

## Week 3

| Questions                                   | Answers                                                                                    |
|---------------------------------------------|--------------------------------------------------------------------------------------------|
| Name the two types of respiration           | Anaerobic and Aerobic Respiration                                                          |
| Does respiration create energy?             | No, it transforms chemical energy into thermal energy                                      |
| What is respiration needed for?             | Life processes (type into google MRS GREN for more info)                                   |
| Both types of respiration need              | Glucose                                                                                    |
| Where does both types of respiration happen | In cells, however aerobic takes place in mitochondria, anaerobic happens in the cytoplasm. |



## Week 4

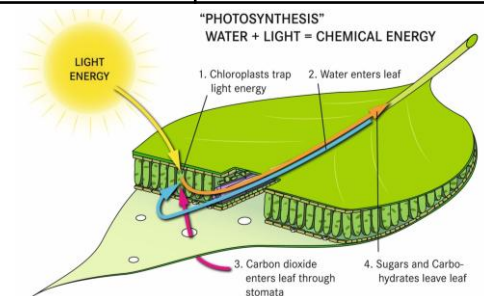
| Questions                                       | Answers                                                                                                                    |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Why don't we respire anaerobically all the time | Anaerobic respiration produces lactic acid which is toxic to us. Our bodies therefore can only use this for short periods. |
| When do we respire anaerobically?               | When we do not have sufficient oxygen to meet our energy needs through aerobic respiration                                 |
| Describe oxygen debt?                           | After exercise we need to take in excess oxygen to break down lactic acid.                                                 |
| What does lactic acid cause?                    | Muscles to cramp and become paralysed if not broken down over time                                                         |
| Why respiration is most efficient               | Aerobic is much more efficient                                                                                             |

## Year 8 Science: Term 1

### Tissues and Organs, Acids and Alkalis

## Week 5

| Questions                               | Answers                                                                                             |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------|
| Where does the reactants come from?     | Carbon dioxide from the air and water is absorbed through the roots                                 |
| Do plants respire if there is no light? | No – photosynthesis must have light to happen                                                       |
| Why is photosynthesis important?        | Glucose is produced which is used for respiration                                                   |
| Why are plants green?                   | Chloroplasts contain chlorophyll which is green.                                                    |
| Are the roots green?                    | No roots do not photosynthesis therefore have no chloroplasts. This is because they are underground |



## Key words:

**Aerobic** – Respiration with oxygen

**Anaerobic** – Respiration without oxygen

**Chloroplast** – Part of plant cell which contains chlorophyll which is needed for photosynthesis

**Distance time Graph** – A graph which shows motion of an object

**Lactic Acid** – Byproduct of anaerobic respiration causes muscle cramps

**Moment** – A force caused by turning an object around a pivot such as a door handle.

**Photosynthesis** – Chemical process which produced Glucose in plant

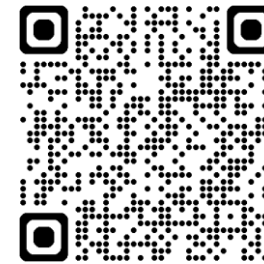
# Where can science take you?

Every topic you do every term links to many different career pathways.

If you want to know more about the careers your learning is linked to look at some of the possible careers this terms learning links to. Scan the QR codes for more information.

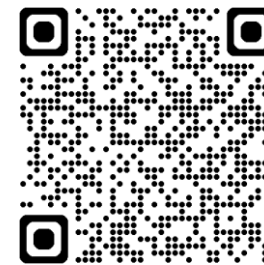
## Topic – Tissues and Organs, Respiration and Photosynthesis

**Fitness Instructor**– This career can involve assessing people's fitness and create personal exercise programmes, demonstrate activities, exercise machines and weights. Helping people exercise safely and give advice on having a healthy lifestyle and leading group exercise classes



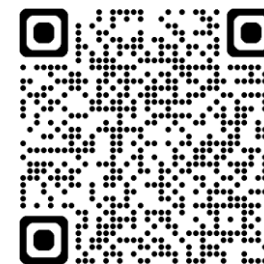
## Topic – Acids and Alkalis

**Gardener** – **This career involves** raise and look after plants from seeds or cuttings, checking soil pH to ensure its is adequate to grow those plants using a variety of acidity regulators to change the pH if required. Adding chemical fertilisers where required to ensure the soils has the correct NPK balance. Digging, plant and weed flower beds and borders. Tidying overgrown shrubs and trees and clear paths

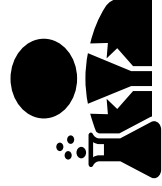


## Topic Speed

**Road Transport Manager** – You will ensure that good and personel arrive where they need to be on time by planning routes, ensuring that vehicles are maintained and roadworthy and that there are people in the correct place at the correct time to drive those vehicles.



***‘Putting Every Student on the Path to a Happy, Successful and Fulfilling Life’***



Year 9 Science! Look forward to learning more about scientific enquiry and consolidating your knowledge

P2.3 Electric Circuits – Resistance



B2.4 Nutrition



P2.4 Light



### STEAM Careers

Where can doing well in science lead?...  
Radiologist, musician, sound engineer, pilot, architect, civil engineer, mechanical engineer, welder, ambulance technician, dental nurse, accountant, florist, chef, electrician, plumber, photographer, pharmacist....  
The possibilities are endless!!!



C2.3 Earth Systems



B2.3 Life Diversity



### Student Development Opportunities in KS3 Science:

STEM Club, help out at Open Evening and special events, Science Week, Competitions



P2.2 Magnetism



B2.2 Respiration and Photosynthesis



C2.2 Changing Substances



P2.1 Speed



### Assessment:

Each term you will complete an End of Term Assessment  
At the end of Year 8 you will complete an End of Year Assessment



C2.1 Acids and Alkalis



B2.1 Tissues and Organs



8

welcome

### Online Learning During KS3:

- GCSE Pod is a school subscription, free to access for students: [GCSEPod](https://www.gcsepod.com/)
- Seneca Learning for revision and consolidation materials: <https://www.senecallearning.com/en-GB/blog/free-key-stage-3-science-revision/>
- BBC Bitesize is a collection of revision materials, quizzes and tests that pupils find accessible: <https://www.bbc.com/bitesize/levels/298jma3>
- Education Quizzes that can be played individually: <https://www.educationquizzes.com/ks3/>