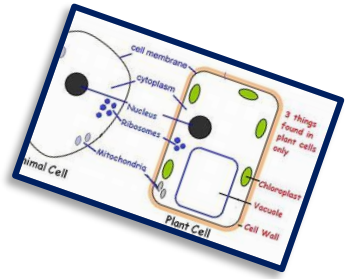
B1 - Cells and Organisation

Prior and Prerequisite learning:

You have learnt how to distinguish between living, non-living and dead things.
You have also examined classification

Living and Non-Living

Animal and plant cells

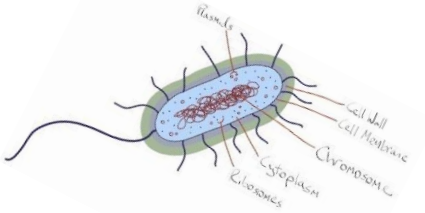


Magnification

Microscopy

Specialised Cells

Stem Cells



Growing Bacteria

Bacterial Cells

The History of the Cell

Why are we learning this?

We all start life as a single cell but grow and adapt to become the amazing complex humans we are today, made up of billions of specialised cells. You will learn the basics of how this happens. You will gain a knowledge of single celled organisms and the history surrounding how they were discovered.

Next steps:

You will be learning about how cells form systems and looking at the Reproductive System.

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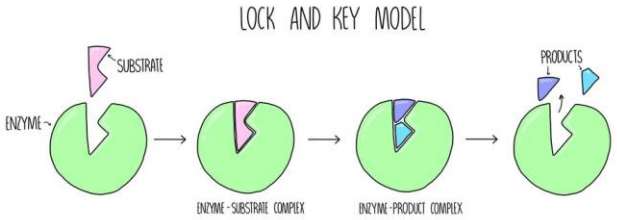
B2 - Humans as Organisms

Prior and Prerequisite learning:

At KS2 you learned how to identify teeth and describe the basic parts of the digestive system. You should know how humans get nutrition and what makes a balanced diet



Nutrition

Food Tests

The Digestive System

Energy Requirements

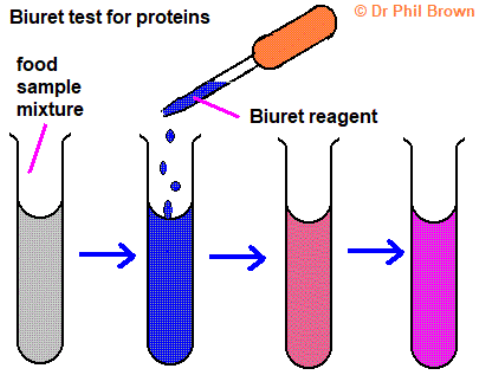
Enzymes

Absorbtion

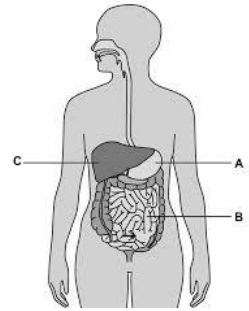
Skeletal System

Muscular System

Next steps:



Respiratory System



Why are we learning this?

We all feel hungry and we all need to eat. This topic helps you to understand why good nutrition is important and what it means to have a healthy balanced diet.

The digestive system is one of several systems that you will study in science. You will begin to find out about how some systems interact

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B4 - Plants and Ecosystems

Prior and Prerequisite learning:

At KS2 you learnt about the life cycles and reproduction of some plants and animals.
You should know some terms relating to where animals live and how they are suited to live in those areas.

Why are we learning this?

It is important to have an understanding of the world around us and how we interact. To harvest the most crops, have use of the best materials and make sure there is enough left for future generations we should interact with our environment in a responsible way.

Photosynthesis

Leaf Structure

Plant Minerals

Dependence

Food Chains and Webs

Pyramids of Number

Decay

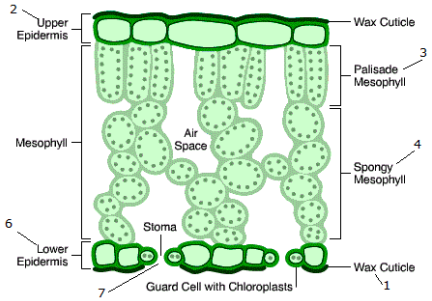
Sampling

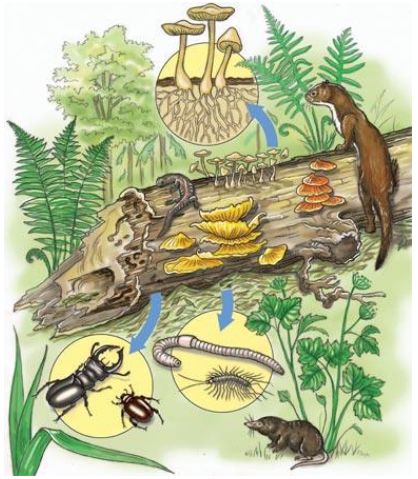
Biodiversity

Bioaccumulation

Classification

Next steps:





You will be learning about conservation, sustainability and further interactions between humans and other organisms at GCSE.

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B5 Health and Disease

Prior and Prerequisite learning:

In your earlier school career you were taught about healthy lifestyles and positive choices around healthy living.
You will have discussed diet and exercise and made links between the two.

Balanced Diets

BMI

Exercise and Respiration

Circulatory System

Heart Disease

Asthma

Smoking

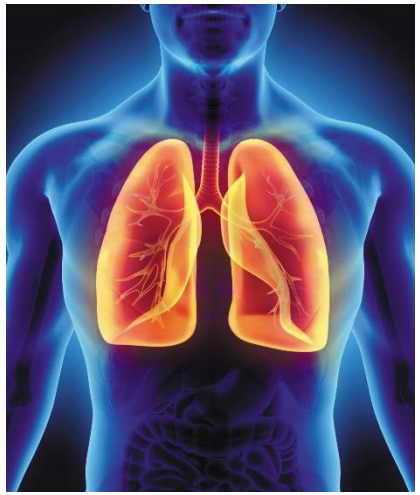
Pathogens

Alcohol

Drugs

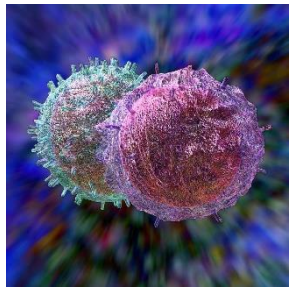
Body Defences

Health and Hygene



Why are we learning this?

Every person benefits from a healthy lifestyle. Knowing how to make informed choices about you life will lead to long term benefits. The knowledge can lead you to careers in the fields of health care and sports and fitness.



Next steps:

As you progress through school you will take some of this knowledge to Health and Disease units at GCSE. You will link this knowledge to specific conditions and illnesses.

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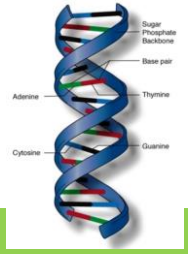
B6 Genetics and Evolution

Prior and Prerequisite learning:

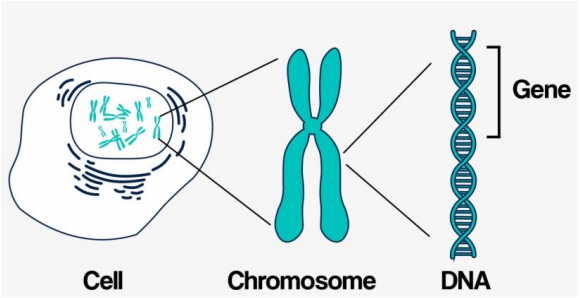
In year 7 you were taught about plant and animal cells. You found out what parts made them and that the nucleus contained DNA. You have been taught how living things interact with their environment and how they adapt.

Why are we learning this?

We all feel hungry and we all need to eat. This topic helps you to understand why good nutrition is important and what it means to have a healthy balanced diet.



- Discovery of DNA
- Chromosomes, DNA and Genes
- Inheritance
- Variation
- Types of Variation
- Natural Selection
- Charles Darwin
- Extinction
- Preventing Extinction
- Mass Extinction



CONSERVATION

Next steps:

At GCSE you will learn more about Darwin and his theory of Evolution. You will find out how proteins are made in the human body and Survival of the Fittest.

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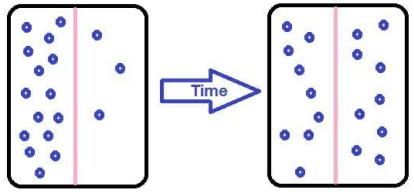
C1 - The Particle Model

Prior and Prerequisite learning:

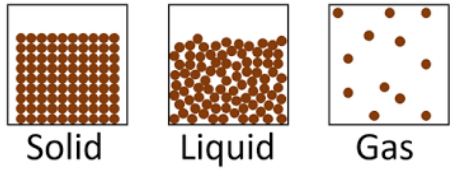
You should be able to compare states of matter and refer to changes in state and refer to the temperature at which this happens. You should be able to compare or group materials based on properties

Why are we learning this?

Everything around you is made from particles. Modelling these particles and how the interact with the environment improves our understanding of materials, properties and life itself.

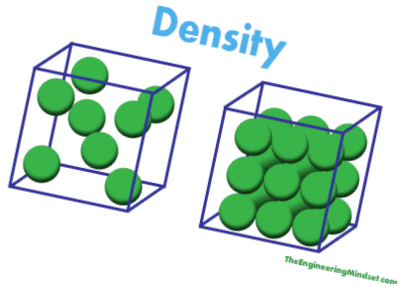


The Particle Model



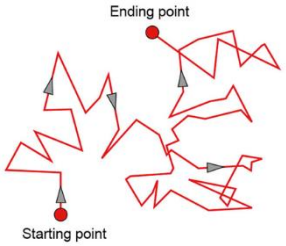
States of Matter

Density



Changes of State

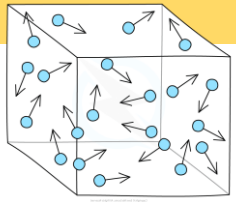
Chemical and Physical Changes



Diffusion

Brownian Motion

Gas Pressure



Next steps:

You will be taking knowledge from this topic and applying it to how particles can be used to model atoms, elements, compounds and mixtures

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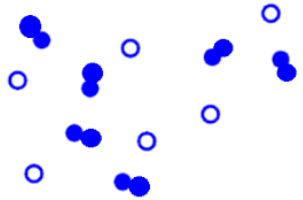
C2 Classifying Materials

Prior and Prerequisite learning:

At KS2 you found out about the properties of materials and how to separate them, using methods such as filtration and evaporation. You should also know that some changes are reversible.

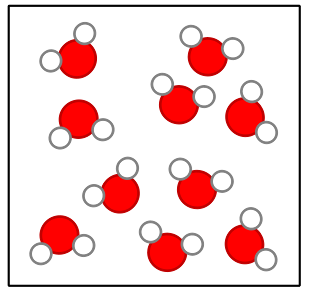
Why are we learning this?

Everything around you is made from particles and it is these that interact to form elements, compounds and mixtures. The knowledge of materials and separation enable us to solve real world problems like sourcing drinking water, purifying substances and solving crimes.



The Atom

Elements

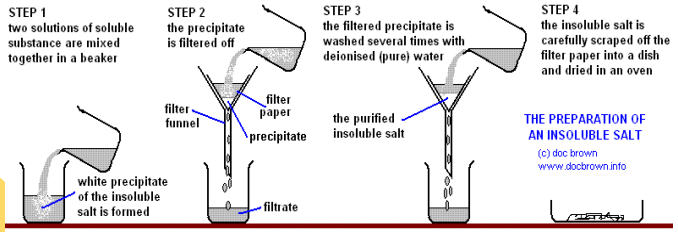


Mixtures

Compounds

Chemical Formulae

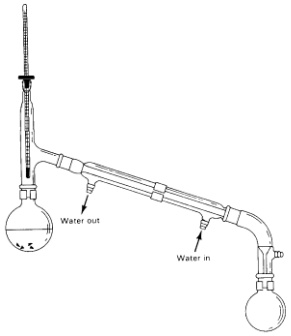
Solutions



Filtration

Solubility

Crystallisation



Distillation

Next steps:

Knowledge from this topic can be used in the next topic where we will be discussing how these materials interact in chemical reactions

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Discover more

C4 - The Periodic Table and Reactivity

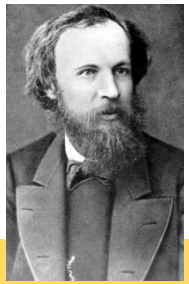
Prior and Prerequisite learning:

At KS2 you found out about the properties of materials and how to classify them. You should be able to describe that some changes in materials result in the formation of new materials

Why are we learning this?

Everything around you is made from particles and it is these that interact to form elements, compounds and mixtures. The knowledge of materials enables us to create structures, new materials and understand chemical interactions in the world around us.

The Periodic Table



Mendeleev

Non-Metals

Metals

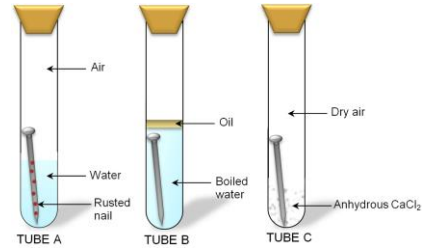
Group 1

Groups 7 and 0

Reactivity Series

Metals and Water

Metals and Oxygen



Metals and Acid

potassium	most reactive	K
sodium		Na
calcium		Ca
magnesium		Mg
aluminium		Al
carbon		C
zinc		Zn
iron		Fe
tin		Sn
lead		Pb
hydrogen		H
copper		Cu
silver		Ag
gold		Au
platinum	least reactive	Pt

Displacement

Extracting Metals

Next steps:

Knowledge from this topic will lead you to further explain the properties of materials and explain trends and patterns within the construction of the Periodic Table.

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C5 – Materials and the Earth

Prior and Prerequisite learning:

At KS2 you found out about the properties of materials and how to separate and classify them. You should understand terms like soluble and insoluble and be able to give uses for every day materials like wood and plastic.

Why are we learning this?

It is important we have an understanding of the structure of the Earth and atmosphere so we can explain interactions we see around us. Knowing about materials and the properties they have means we can create buildings and products fit for purpose and suited to every day life

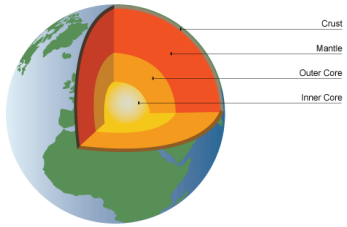
Earths Structure

Igneous Rocks

Sedimentary Rocks

Metamorphic Rocks

Fossils



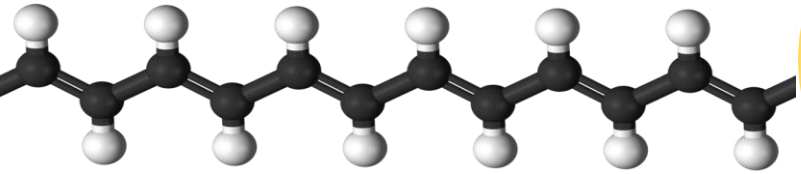
Crude Oil

The Atmosphere

The Carbon Cycle

Climate Change

Ceramics
Polymers
Composites



Mining and Quarrying

Recycling

Next steps:

Knowledge from this topic can be used in the next topic where we will be discussing how these materials interact and how they are fit for purpose. We will also look at the impacts of the Green House Effect on our planet.

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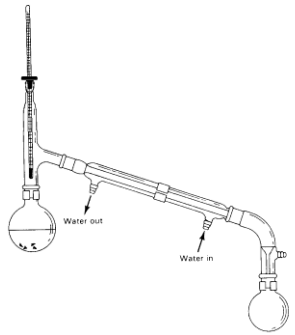
Chemical Reactions

Prior and Prerequisite learning:

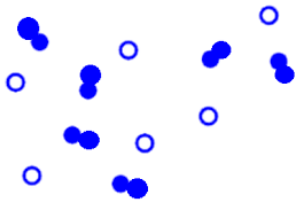
At KS2 you found out about the properties of materials and how to separate them, using methods such as filtration and evaporation. You should also know that some changes are reversible.

Why are we learning this?

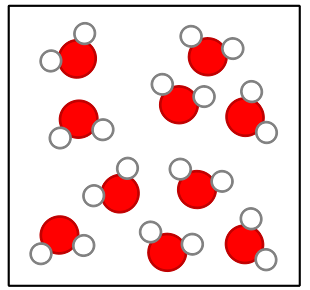
Everything around you is made from particles and it is these that interact to form elements, compounds and mixtures. The knowledge of materials and separation enable us to solve real world problems like sourcing drinking water, purifying substances and solving crimes.



Elements



Atoms

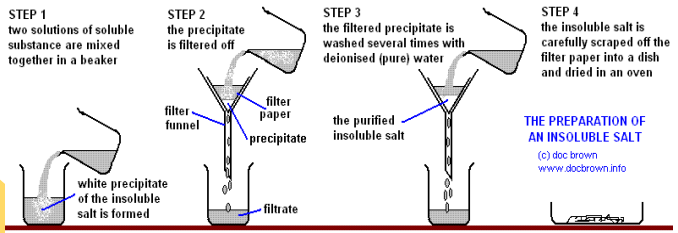


Chemical Formulae

Compounds

Mixtures

Solutions

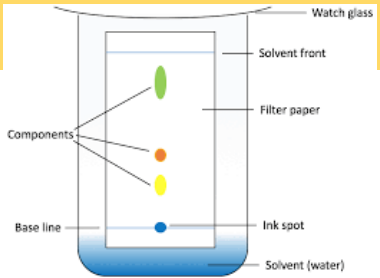


Filtration

Distillation

Solubility and Crystallisation

Chromatography



Next steps:

Knowledge from this topic can be used in the next topic where we will be discussing how these materials interact in chemical reactions

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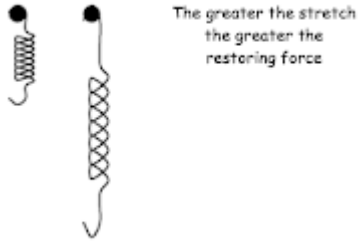
P1 - Forces

Prior and Prerequisite learning:

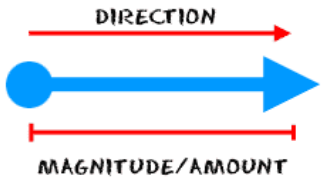
You should be able to explain forces acting on objects as they fall. You have learnt about forces that oppose movement including friction and air resistance. You should be aware that levers, pulleys and gears help small forces have larger impacts

Why are we learning this?

Forces impact us every second of every day. They are the fundamental principle behind every day actions and reactions. Without forces, very little would happen!



Forces



Types of Force

Unbalanced Forces

Balanced Forces

Friction

Streamlining

Investigating Friction

Elasticity

Moments

Next steps:

You will be taking knowledge from this topic and applying it to how forces impact motion and movement in future science lessons in year8.

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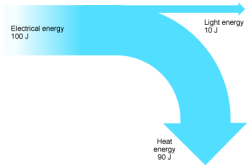
P2 - Energy

Prior and Prerequisite learning:

Energy stores and transfers could be a lot of new learning. You have been taught about sound, light and heating. Energy may have been discussed during this. You have been taught how energy moves through a food chain and that it transfers.

Why are we learning this?

Energy stores and transfers are all around us all of the time. Energy has to be shifted to make things happen. Understanding these concepts allow us to effectively heat our homes, get the most out of products we design and make the most out of life itself.



Energy Stores and Transfers

Efficiency

Conduction

Convection

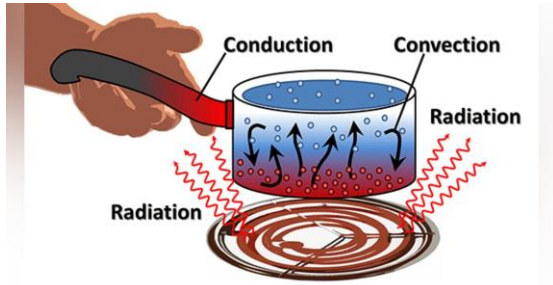
Radiation

Controlling Thermal Energy Transfers

Power, Energy and Cost

Non-Renewable Energy Resources

Renewable Energy Resources



Next steps:

You will be taking knowledge from this topic and applying it to lots of different scenarios in Science – this will be in Biology, Chemistry and Physics. Energy is a key concept in Science.

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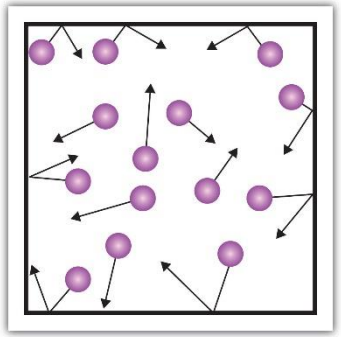
P4 Forces and Motion

Prior and Prerequisite learning:

You should be able to explain forces acting on objects as they fall. You have learnt about forces that oppose movement including friction and air resistance. You should be aware that levers, pulleys and gears help small forces have larger impacts

Why are we learning this?

Forces impact us every second of every day. They cause objects to change shape, stretch and move.
They are linked to pressures and play a vital role in engineering and every day life.



Speed

Speed, Distance & Time Graphs

Acceleration

Relative Motion

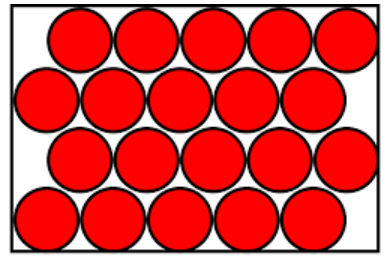
Friction

Drag Forces in Air

Pressure in Gases

Pressure in Liquids

Pressure in solids

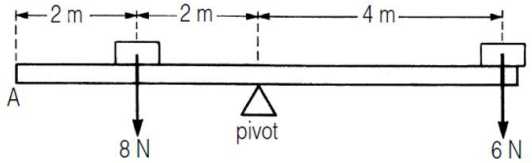


Solid

Moments

Next steps:

You will be taking knowledge from this topic and applying it to how forces relate to real world scenarios at GCSE, linking this to Newtons Laws.



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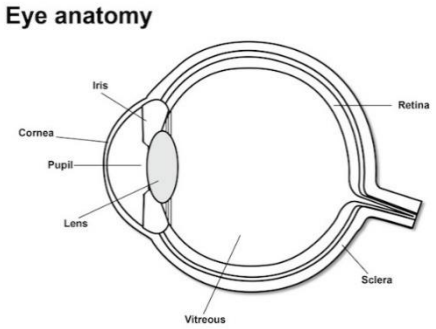
P5 - Waves

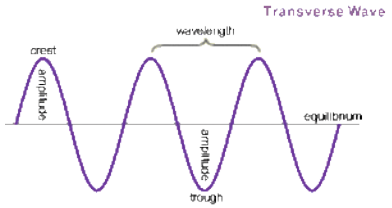
Prior and Prerequisite learning:

Whilst you may not have met the term wave in science before you will have studied light and sound. You have learned about states of matter and how to represent solids, liquids and gases. You have also learned about energy and shifts in energy.

Why are we learning this?

Waves are a method of shifting energy from store to store. Understanding how this shift happens and how it is impacted by different materials allows us to use apply this knowledge to different scenarios.





The Nature of Waves

Wave Equation

Hearing

Volume and Pitch

The Ear

Echo and Ultrasound

Light

Lenses

Refraction

Reflection

The Eye

Colour

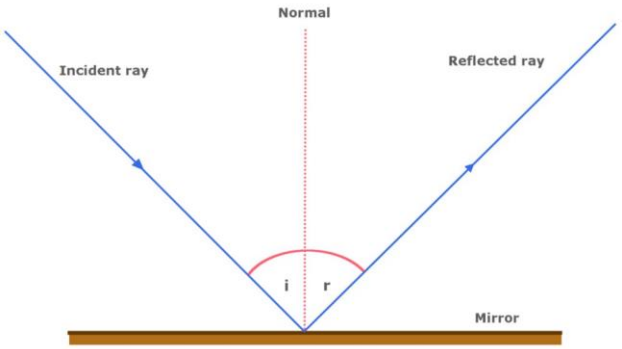
Next steps:

speed or velocity (ms^{-1})

$v = f\lambda$

wavelength (m)

frequency (Hz)



You will be taking knowledge from this topic and applying it to lots of different scenarios in Science – this will be in Physics for a lot of the time. You will be finding out out more about waves, radiation and the EM Spectrum at GCSE.

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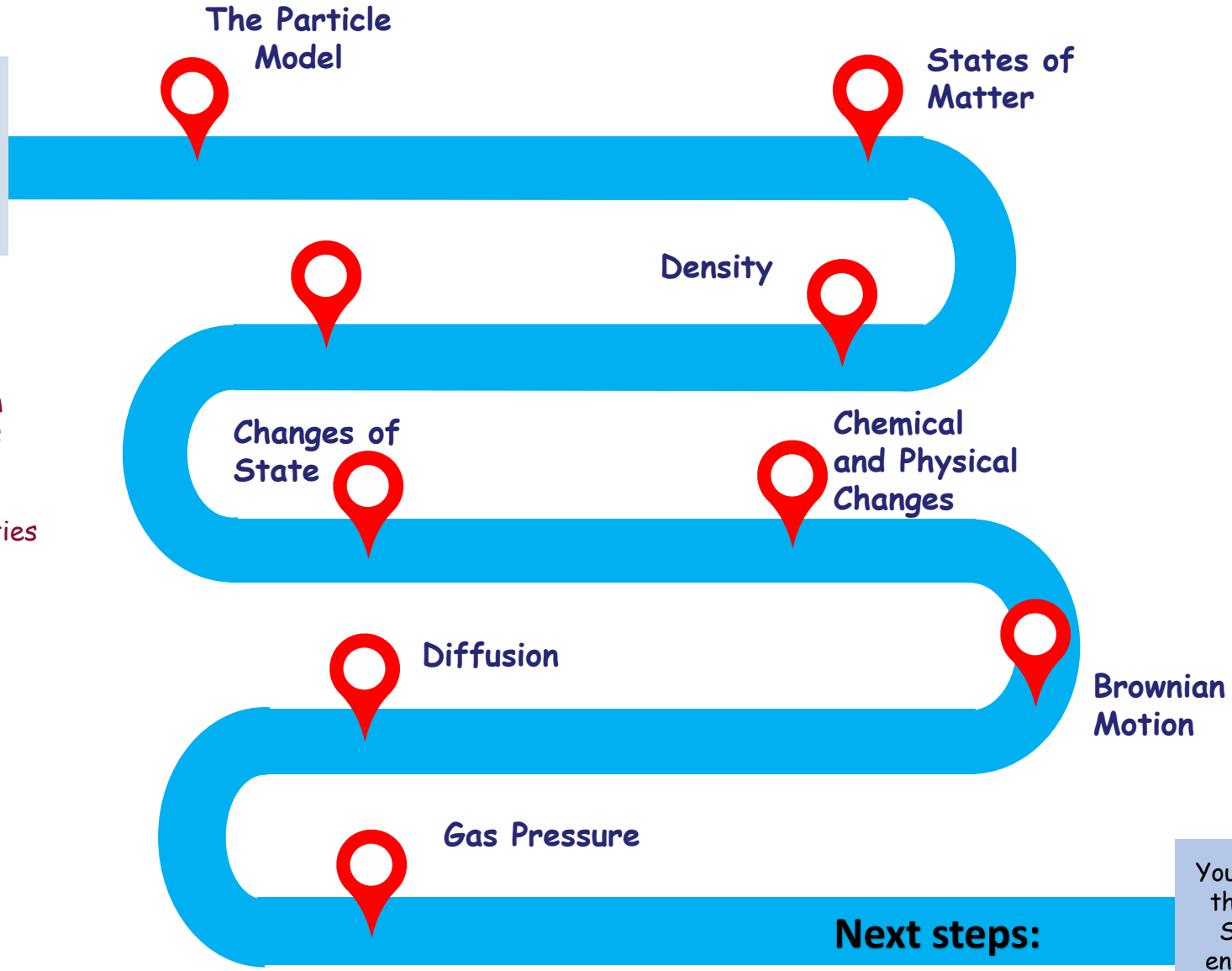
Prior and Prerequisite learning:

Space

You should be able to compare the motion of the planets relative to the sun and the moon relative to the Earth. You should be able to explain the apparent movement of the sun and moon across the sky.

Why are we learning this?

Everything around you is made from particles. Modelling these particles and how the interact with the environment improves our understanding of materials, properties and life itself.



You will be taking knowledge from this topic and applying it to the Space Physics topic when it is encountered later in your school career.

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