Year 8 - Science - Spring Term - Biology

Keyword List	Definition
DNA	Long chemical substance with all your genetic information
Gene	A short section of DNA
Chromosome	A long coiled up length of DNA
Inheritance	When a characteristic is passed on from one generation to another
Variation	The difference in characteristics in organisms
Continuous variation	Variation with a range of values
Discontinuous variation	Variation with certain values
Natural selection	The gradual change in the characteristics of a organism based on the survival in an environment
Ecosystem	All the living organisms and the area they live in
Interdependence	Organisms relying on each other in order to survive
Adaptation	Features and characteristics that allow an organism to survive
Habitat	The area in which an organism lives in
Food chain	The sequence of energy flow in an ecosystem
Food webs	Show how food chains are linked together
Competition	When organisms compete for resources such as food/water/shelter/mates
Toxins	A poisonous substance which can cause bad health

Biology term 2 checklist	☑
To define the term DNA	
To define the term gene	
To define the term chromosome	
To describe how inheritance can be effect by genes	
To describe how inheritance can be effect by the environment	
To compare the two types of variation	
To be able to describe natural selection	
To define ecosystem	
To define habitat	
To describe the effect of interdependence	
To describe how adaption can lead to survival of an organism	
To describe what a food chain shows	
To describe what a food web shows	
To name what plants and animals may compete for and describe the effects of it	

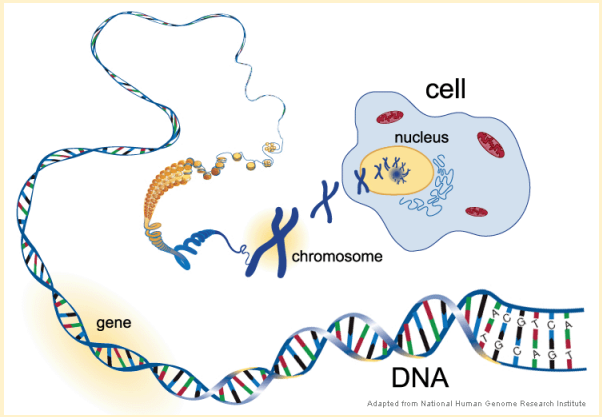
Year 8 - Science - Spring Term - Biology

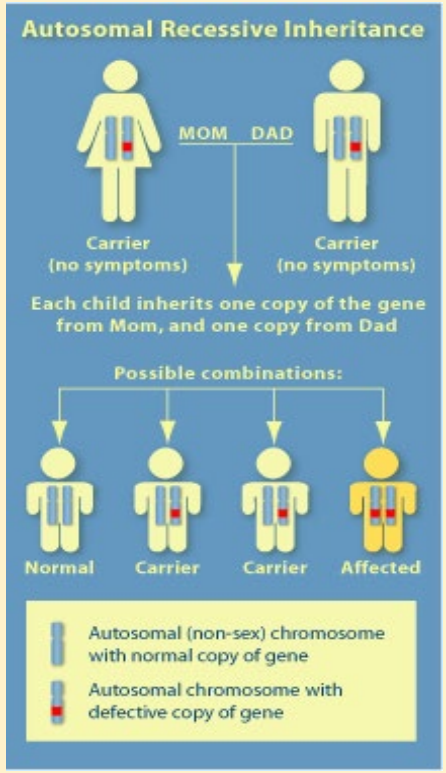
Inheritance

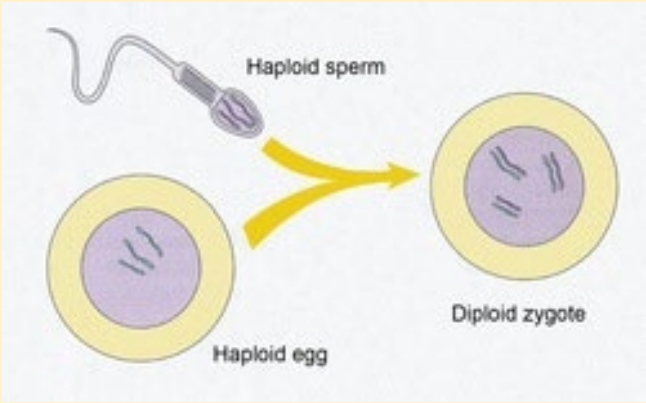
INHERITANCE - An inherited characteristic is controlled by genes and is passed on from parents to offspring in DNA.

Body cells contain a pair of each chromosome – one from each parent. In sexual reproduction, gametes (egg and sperm cells) each contain one copy of each chromosome.

These join together at **fertilisation.**







Mutations are changes in DNA and can cause certain genetic conditions such as cystic fibrosis.

Variation

Variation

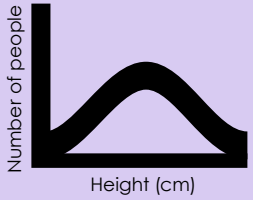
Variation is the differences between all living organisms.

It happens because of our **genes** in our DNA.

- It can also result from environmental effects

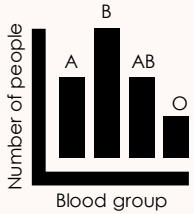
Continuous variation

Continuous variation – where a characteristic can have any value within a range. E.g. height or weight



Discontinuous variation

Discontinuous variation – where a characteristic can only have a certain value. E.g. blood or eye colour



Natural Selection

The process by which a characteristic increase or decreases in a population gradually.

Organisms compete for survival. → **The organism with the survival trait is more likely to survive.** → **These organisms are more likely to reproduce and pass on the trait.** → **Over time, the useful trait spreads in the population**

The scientist that discovered natural selection was called Charles Darwin!

Year 8 - Science - Spring Term - Biology

Interdependence

Ecosystems

Habitat

The place/area where an organism lives

Adaptations

Features and characteristics that allow an organism to survive

Ecosystem

All the living organisms in an area together with their environment

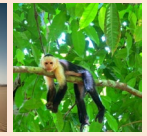
Interdependence

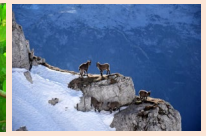
Organisms relying on each other in order to survive (a change in one affects the other)

Examples


Ocean


Desert


Jungle


Mountains

Examples


Claws


Camouflage


Thick fur


Shell

Living Organisms
Animals
Plants
Disease

Environment
Water
Climate
Sunlight

Examples

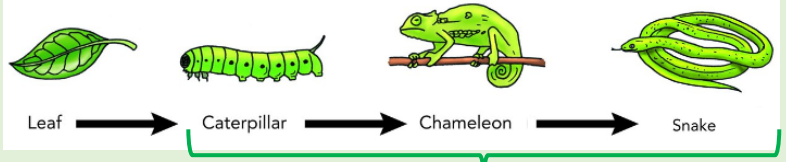


Some animals rely on others for health and cleaning


Others rely on them for food

Food Chains

Food chains show how energy passes from one organism to another.



HERBIVORE – an organism that only eats plants
OMNIVORE – an organism that eats plants or animals
CARNIVORE – an organism that only eats animals

Producer

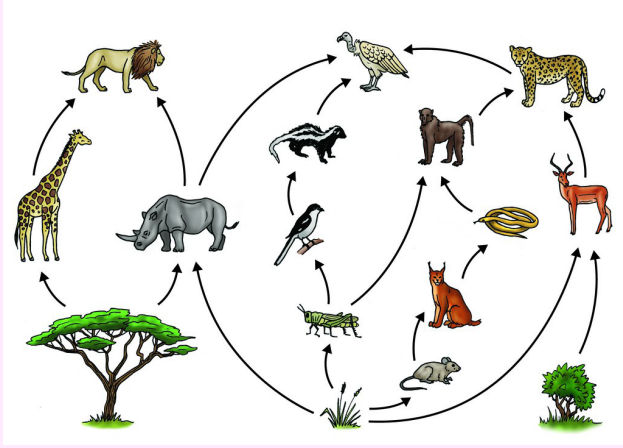
These make their own food and start a food chain. Eg plant or algae

Consumer

Animals that eat other animals or plants

Food Webs

Food webs show how food chains are linked together. They highlight interdependence because you can clearly see how a change in population will affect other organisms.



Example
An increase in the number of lions would mean they ate more giraffe or rhino, affecting their populations.

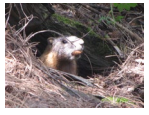
Equally, a decrease in the population of mice would affect food supply for the lynx.

Competition

Resources on Earth are limited – all organisms must learn how to share them! Because of this, animals and plants compete for these resources.

Animals Compete For:

Food 

Space 

Mates 

Water 

Plants Compete For:

 Light

 Space

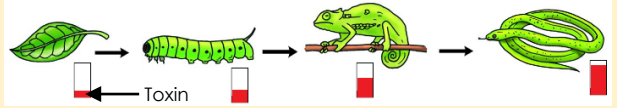
 Nutrients

 Water

Stretch and Challenge!

BIOACCUMULATION – the build up of toxins/poisons in organisms through a food chain.

Toxins/poisons can build up as they're passed along the food chain. They may not harm the producer or primary consumer, but can become very harmful for consumers at the end of the food chain, such as humans.



Small amount of toxin (often pesticides) are absorbed by the plant. These are then taken in by the primary (first) consumer. The toxin is then passed along the food chain in increasing amounts at each level.

Year 8 - Science - Spring Term - Chemistry

Keyword List	Definition
Chemical change	A reaction which cannot be reversed
Physical change	A reaction which can be reversed
Salt	A product made when a metal reacts with acid
Concentrated	When a certain volume has many particles of a substance and less water
Diluted	When a certain volume has less particles of a substance and more water
Acids	A substance with a pH of 1-6

Chemistry term 2 checklist	☑
To describe what a physical change is and examples	
To describe what a chemical change is and examples	
Be able to predict the name of a salt from a reaction	
To be able to define what a concentrated solution is	
To be able to describe what a dilute solution is	

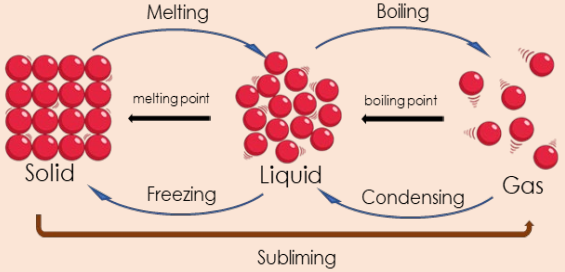
Types of Reaction

Chemical and Physical Reactions

Physical Changes

In a physical reaction the atoms are simply moved or their pattern is rearranged.
They are reversible changes.

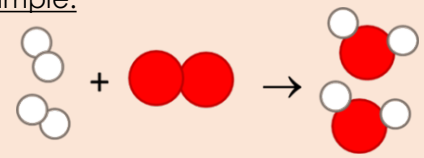
Example:
State changes



Chemical Changes

In a chemical reaction, the bonds between the atoms are broken and the atoms put back together differently.
This produces something new.
This is not easily reversible.

Example:



Hydrogen Oxygen Water

Rules for Naming Salts

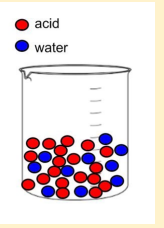
Salts always have **two** names.
First name – **metal** taken from the **base.**

*E.g. Salts made with **sodium** hydroxide will always start with **sodium**.*

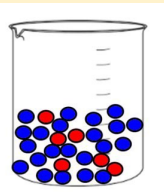
Second name – comes from the type of **acid** used.

Hydrochloric acid – chloride
Sulfuric acid – sulfate
Nitric acid – nitrate

Concentrated and Dilute



Concentrated
Many acid particles to few water particles.
Often corrosive



Dilute
Many water particles to few acid particles.
Often irritant

Year 8 - Science - Spring Term - Physics

Keyword List	Definition
Thermal Energy	How much energy is stored in a substance due to the vibration of its particles
Temperature	A measure of the average kinetic energy of particles
Radiation	Transfer of thermal energy as a wave
Convection	Transfer of thermal energy when particles in a fluid are heated.
Thermal conductor	Material that allows heat to transfer through it quickly .
Conduction	Transfer of thermal energy by the vibration of particles.
Thermal Insulator	Material that only allows heat to travel through it slowly .
Renewable energy resource	Energy resource that will not run out
Non-renewable energy resource	Energy resource which will run out e.g. coal, oil and gas
Wind energy	Renewable energy made by wind turbines
Wave energy	Renewable energy made by the waves in the ocean
Tidal energy	Renewable energy made by the tides in the sea/ocean
Solar	Renewable energy made by solar panels which absorb the suns energy
Hydroelectric	Renewable energy made by dams which hold water
Geothermal	Renewable energy made by hot rock under the earth such as volcanoes
Biofuel	Renewable fuel made by plants

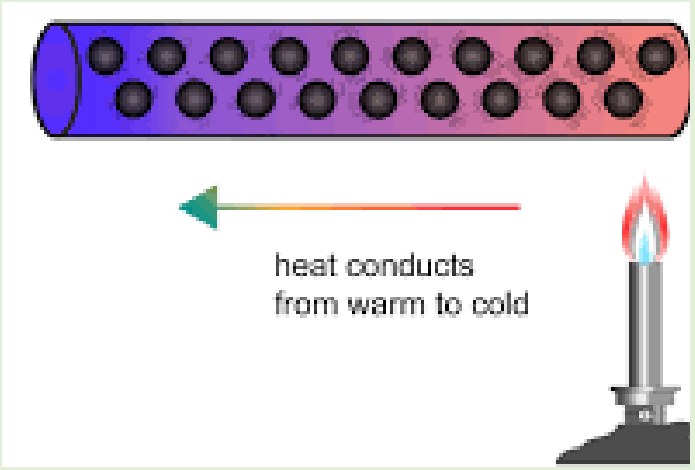
Physics term 2 checklist	☑
To explain how a method of thermal insulation works in terms of conduction	
To sketch a graph to show the pattern of temperature change against time	
To explain how a method of thermal insulation works in terms of convection	
To sketch diagrams to show convection currents	
To identify that radiation does not require particles	
Describe which materials absorb/emit radiation	
Be able to define renewable	
Be able to define non-renewable	
To describe some examples of renewable energy	
To describe some examples of non-renewable energy	
To explain why we are coal, oil and gas are non-renewable	
To compare the advantages and disadvantages of renewable energy	
To compare the advantages and disadvantages of non-renewable energy	

Year 8 - Science - Spring Term - Physics

Heating and Cooling

Conduction

Conduction is the method of **thermal energy** transfer through solids. When particles are heated, they gain energy and begin to **vibrate**. This causes them to collide with neighbouring particles and the energy is passed along.

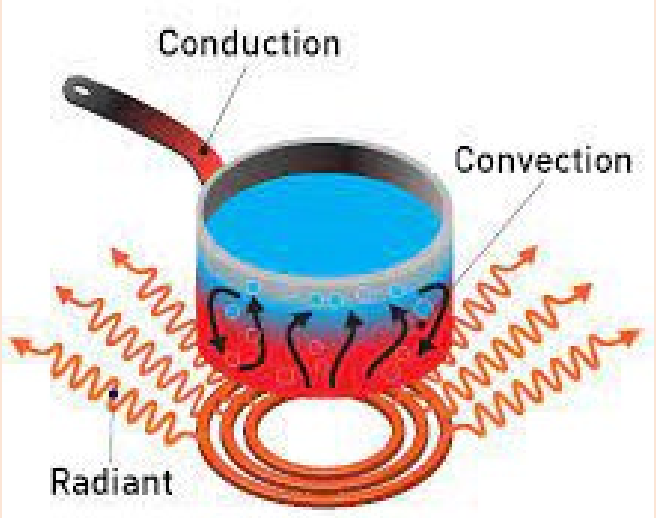


Radiation

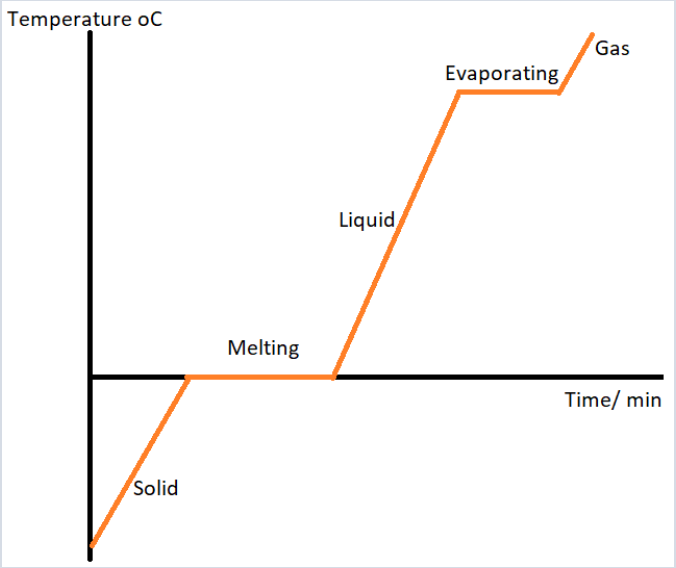
Radiation is the method of **thermal energy** transfer via waves. This does not need particles as these waves can travel through a vacuum.

Convection

Convection is the method of **thermal energy** transfer through fluids (liquids and gases). When particles are heated, they gain energy and begin to **vibrate**. Particles with more energy rise to the top and those with less energy sink. This process continues, forming a convection current, until all the fluid is heated.



Temperature change over time



Conductors and Insulators

Thermal conductors allow thermal energy to pass through quickly and easily. An example of a thermal conductor are **metals**

Thermal insulators do NOT allow thermal energy to pass through quickly or easily – it is very slow and difficult. Examples of thermal conductors are most non-metals and wood/plastic etc.

Year 8 - Science - Spring Term - Physics

Physics – Powering Earth

Renewable Energy Resources

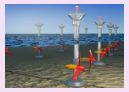
These are energy resources that can be replenished as it is being used. They don't run out.

Biofuel: Biofuel comes from living things. Plants are grown and burnt in power stations to produce heat energy which is used to generate electricity. Although CO_2 is produced, the plants take in CO_2 during photosynthesis when regrown.

Geothermal: Geo and Thermal refers to the earth and Heat. Water is heated by hot rocks underground which is used to produce steam and the steam is used to drive turbines for generating electricity. No CO2 is released in this process.

Hydroelectric: Made up of two words, Hydro which is water and Electric, Hydroelectric makes use of water stored behind a Dam or a high reservoir and allowed to flow down to turn a turbine to produce electricity.

Solar: The suns energy is converted to electrical energy directly. This does not involve any turbine. The solar panels should be facing a direction where there get maximum sunlight. This can be unreliable during cloudy days and at night.



Tidal: As the tide goes in and out, it pushes and turns turbines which generate electricity. This is quite reliable as the tides are always available.

Waves: Moving waves pushes and turns a turbine which generates electricity. Wave energy is unreliable as the sea can sometimes be very still.

Wind: Wind directly drives a turbine which is connected to a generator which produces electricity. The disadvantage is that it is not always windy, so it is unreliable.

In general, renewable energy resources are more sustainable, does not cause global warming and saves natural resources for mankind and have economic benefits.

Non-Renewable Energy Resources

A **non-renewable** energy resource is which will eventually run out. They are described as finite. They are being used quicker than they can be replaced.

Formation of Fossil Fuel

Ancient dead plants

Millions of years

coal

Ancient dead sea creatures

Millions of years

Oil

Gas

Heat and pressure helps in producing fossil fuels

Coal is formed from dead plants, and it forms over millions of years. Oil and gas on the other hand are formed from dead sea creatures also over millions of years. It takes too long to replenish.

Disadvantages of using fossil fuels

- **Fossil fuels and nuclear energy can be used to generate electricity using turbines and a generator.**
- **They are also used as fuels in the home for heating, cooking and vehicles.**
- **Fossil fuels release carbon dioxide when used which causes global warming.**
- **Solid particulates are also released from diesel vehicles and power stations which causes global dimming.**
- **The use of fossil fuels can also release sulphur dioxide and nitrogen dioxides which causes acid rains and breathing problems.**

Advantages & Disadvantages of using Nuclear Energy

+ **Nuclear Energy does Not release carbon dioxide into the atmosphere.**
+ **They also release very large amounts of energy for every kilogram compared to coal, oil and gas.**
+ **On the other hand, Nuclear energy produces nuclear wastes which are very difficult to get rid of.**