

Topic: Y8 Earth and Atmosphere

Duration: 8 lessons

Composite:
Unit test

Key vocabulary: Core and Powerful knowledge components crucial to commit to long term memory
(P) Powerful knowledge

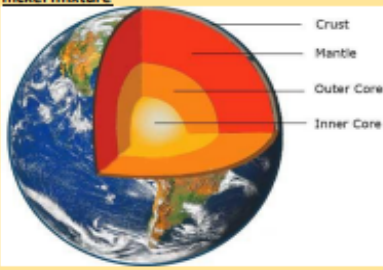
Links:
KS2: States of matter, properties and changes of materials

Atmosphere
Sedimentary
Igneous
Metamorphic
Grains
Weathering
Erosion
Transport
Deposition
Compaction
Cementation
Sediment
Magma
Crystallise
Recrystallise
Temperature
Pressure
Carbon store
Global warming
Climate change
Greenhouse
Recycling

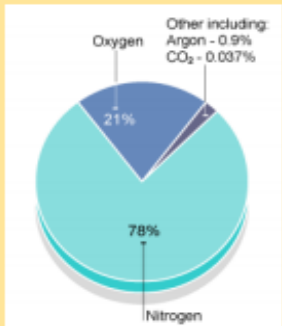
Year 8 Earth and Atmosphere Knowledge Organiser

(P) Powerful knowledge

(P) Label the four main layers of the earth and describe what they are made of
Crust: rock; mantle rock; outer core: Liquid iron and nickel mixture. Inner core solid iron and nickel mixture

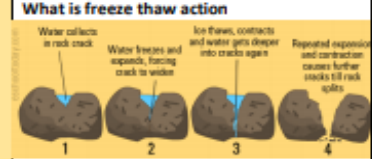


(P) What are the proportions of the gases in our atmosphere?



What causes chemical weathering?
Gases dissolve in rainwater making it acidic. This reacts with some types of rock.

What is freeze thaw action



Water freezes in cracks in rocks. When this water freezes it expands and pushed the gap apart Eventually the rock will split

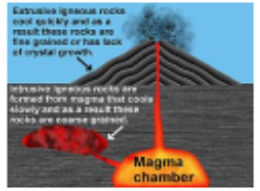
What can cause biological weathering?

- Tree roots get into cracks in rocks
- Over time the roots grown and fore the rock apart

State the name of some igneous rocks
Granite and basalt

How do igneous rocks form? From the cooling and solidification of molten rock (magma)

How does cooling rate affect crystal size in igneous rocks?
The faster the magma cools the smaller the crystal size



State the names of some metamorphic rocks
Slate, marble

How do metamorphic rocks form
From existing rocks that are changed by high temperatures and/ or pressure

Which materials can be recycled? Paper, plastics, metals

What advantages are there to recycling? Less energy is used and finite resources are not used

What disadvantages are there to recycling? Sorting and cleaning is expensive and time consuming

(P) What is the word equation for respiration?
Glucose + oxygen → carbon dioxide + water + energy

(P) How does a greenhouse gas cause climate change?
Gases such as methane and carbon dioxide prevent radiation from the earth escaping into space. They trap this heat in the atmosphere which heats up.

(P) What impacts are there from climate changes?
More extreme weather such as droughts, heavy rain, melting of polar ice and sea level rises that cause flooding

(P) What is the word equation for combustion?
Fuel + oxygen → carbon dioxide + water + energy

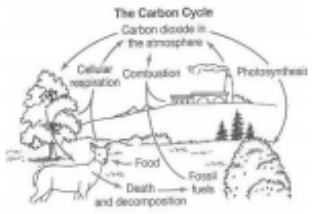
(P) What is the word equation for photosynthesis?
Carbon dioxide + water + energy → glucose + oxygen

How can humans reduce greenhouse emissions and the impact of climate change?
Use renewable energy sources; recycle, use public transport, fly less, plant based diet

Which processes put carbon dioxide into the atmosphere?
Combustion, respiration

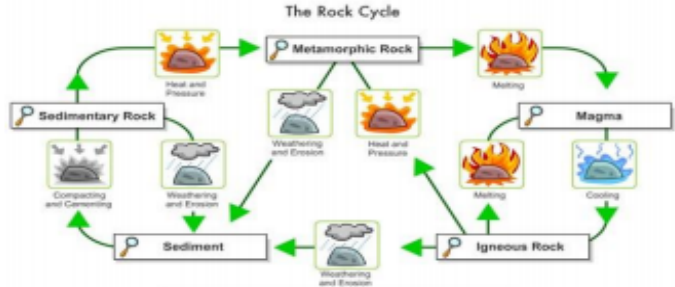
Which processes remove carbon dioxide from the atmosphere?
Photosynthesis and CO2 dissolving in the oceans

Where can carbon be stored?
Oceans, atmosphere, living things, fossil fuels, sedimentary rocks



| Process | Meaning |
|-------------|---|
| Weathering | Breaking down of rock into smaller pieces |
| Erosion | Wearing away of sediment by water, wind or ice |
| Transport | The movement of sediment by water, wind or ice |
| Deposition | When transport slows down and the sediment is dropped |
| Compaction | When layers of sediment squash layers of sediment beneath |
| Cementation | When a compound sticks sedimentary grains together |

The Rock Cycle



Y7: Particle model
Atoms, Elements and Compounds.
Chemical and Physical Change.
Combustion

Y8 Plants
KS4:
Combustion; separation of crude oil, evolution of the atmosphere

Topic: YEAR 8 LIGHT AND SOUND

Duration: 11 lessons

Composite:
Unit test

Core Key vocabulary:

Core knowledge Components

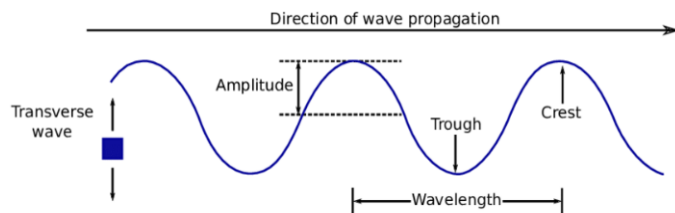
Powerful knowledge components crucial to commit to long term memory (in red box)

Links to previous and future topics

Oscillation
Amplitude
Frequency
Wavelength
Transverse
Longitudinal
Reflection
Refraction
Superpose
Peak
Trough
Compression
Rarefaction
Vibration
Medium
Vacuum
Hertz/kilohertz
Amplify
Decibels
Echo
(non) luminous
Transmit
Transparent
Opaque
Translucent
Wave
Image
Virtual/Real
Upright/inverted
Magnified/diminished
Specular
Diffuse
Incident/Incidence
Convex/converging
Focus/focal point
Spectrum
Dispersion

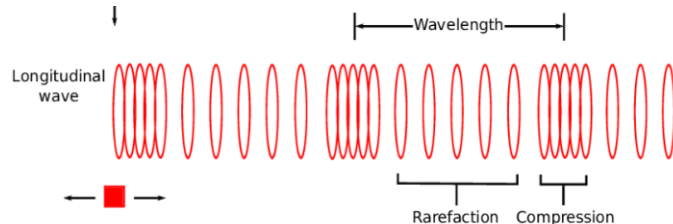
Waves - general

1. A labelled transverse wave.



2. Examples of transverse waves: ripples on the surface of water, vibrations in a guitar string, a Mexican wave in a sports stadium.

3. Draw a labelled longitudinal wave.



4. Name examples of longitudinal waves. sound waves, ultrasound waves, seismic P-waves

Sound

5. The speed of sound travels fastest in a solid then a liquid and slowest in a gas. This is because the particles of a solid are closer together than in a liquid or gas.

6. The **speed of light** is much faster than the **speed of sound** in air. If you want to **compare, the speed of sound** in air is 343 m/s and the **speed of light** is 300,000,000 m/s

7. How an ear works. Pinna: Directs the sound wave to your auditory canal, Auditory Canal: The sound travels through this passage to the ear drum, Ear Drum: This vibrates passing on the sound, Ossicles: Tiny bones that amplify the vibrations, Cochlea: Contains fluid that vibrates, causing hair bundles to vibrate and turn movement into electrical signal, Auditory nerve: Electrical signal from hair bundles in cochlea travel through this nerve to the brain.

POWERFUL KNOWLEDGE

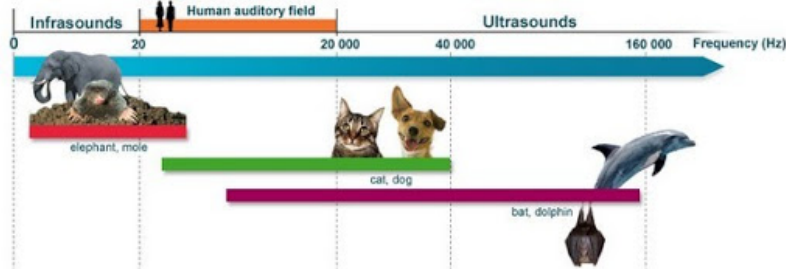
- There are different types of waves and all transfer energy.
- Waves have 3 important features: wavelength, frequency and amplitude.
- When waves hit a barrier or another substance (medium), they can:-
 - Reflect = bounce off
 - Refract = change speed so change direction
 - Disperse = spread out thinly in all directions
 - Superpose = waves add together or cancel out
 - Diffract = waves spread out when they superpose
 - Superpose – when waves join together so that they add or cancel out.
- Waves are transverse or longitudinal and transfer energy in a different way.
- Sound waves need a medium (substance) to travel through; can't travel in a vacuum. The medium affects the speed of the sound wave.
- Sound wave: frequency determines pitch; amplitude determines volume.
- Law of Reflection: angle of incidence = angle of reflection.
- Refraction is the changing speed and direction of a wave as it moves from 1 medium to another.

KS2: Light, Sound waves, energy and waves

KS4: Waves; Light and the EM Spectrum; Radioactivity – Electrons & Orbits

KS5: Physics: Waves 1 and 2, Oscillations, Stars, Cosmology

8. The frequency of human hearing compared to that of other animals

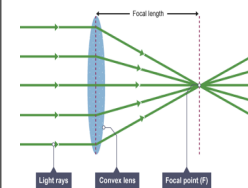


9. Hearing can be damaged by a blockage in the auditory canal, damage to the ear drum, head injuries, very loud sounds, infections can affect the cochlea or the signals through the auditory nerve, age.
10. A microphone detects the sound waves and these make the diaphragm vibrate, which moves the coil over the magnet. This creates an electrical current which can be amplified.
11. Ultrasound is sound waves with a frequency greater than 20 000Hz. Ultrasound is used for; scanning the foetus inside the uterus, Physiotherapists use ultrasound to reduce pain and swelling in a damaged tendon, Doctors use ultrasound to investigate abdominal pain or lumps without using surgery, animals use ultrasound for echolocation and to locate prey, ships use SONAR to identify underwater objects and the sea bed.
12. The similarities between an eye a pin-hole camera are that both require light and the differences between the eye and a pin-hole camera are that an eye has a lens, a pin-hole camera does not.
13. When **light passes through a prism** the **light** bends. As a result, the different colours that make up white **light** become separated. This **happens** because each colour has a particular wavelength and each wavelength bends at a different angle.
14. There are three primary colours in light: red, green and blue. Light in these colours can be added together to make the secondary colours magenta, cyan and yellow. All three primary colours add together make white light
15. A **filter** is a transparent material that absorbs some **colours** and allows others to pass through for example a yellow **colour filter** will let through only yellow and absorb all other **colours**. This is known as subtracting the colour.

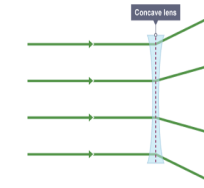
Light

1. Transmit is to send or convey something from one person, place or thing to another. Emit is to send out or give off.
2. Transparent objects allow all the light to pass through them. Translucent ones allow partial light to pass. Opaque ones allow no light to pass through.
3. Transparent objects allow all the light to pass through them. Translucent ones allow partial light to pass. Opaque ones allow no light to pass through.
4. The law of reflection states that the angle of incidence equals the angle of reflection; examples include the reflection of light, sound and water waves.
5. Specular reflection is what you get from a polished surface, or mirror. It is clear, and you can see "through" the mirror. A diffuse reflection is what you get from a white wall. The light is bounced off it, but in random directions so you cannot see the light source in the reflection.

Convex Lens



Concave Lens



A labelled diagram to describe how the eye works.

