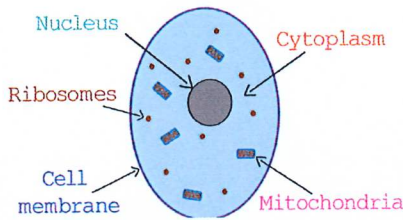


Year 7 - Cells

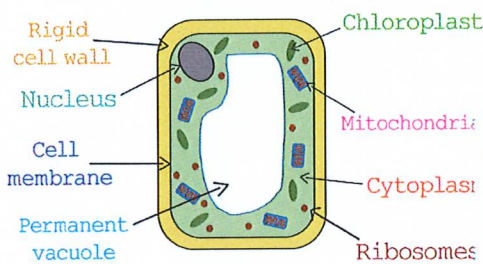
Threshold Concept

Understand that all living things are made of cells

Structure of animal cell



Structure of plant cell



Keywords

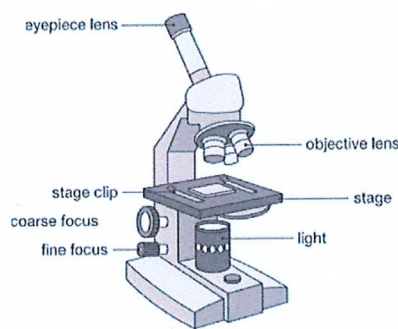
Animal Cell - Building block of all animal life
 Plant Cell - Building block of plant life
 Microscope - Utensil used to enlarge objects
 Prokaryote - Cell without nucleus
 Eukaryote - Cell containing a nucleus
 Cell - Basic building block

Comparing cells

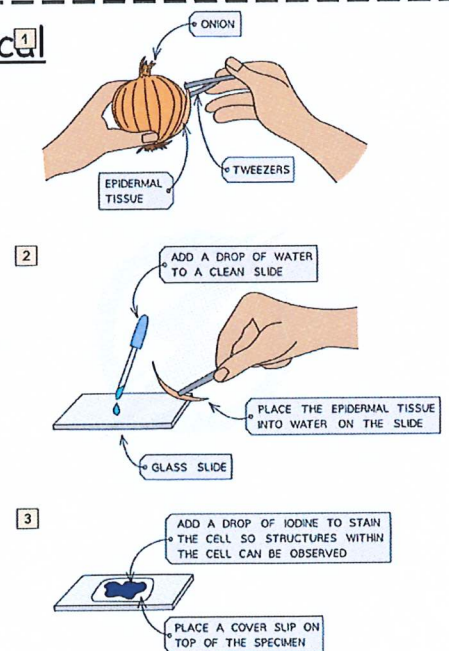
Organelle	Responsible for
Nucleus	Housing DNA, 'brain' of the cell
Mitochondria	Energy production, 'power house' of the cell
Golgi apparatus	Sorting, packaging and transport of proteins
Endoplasmic reticulum	Synthesis and processing of proteins, lipid expression
Chloroplast	Photosynthesis, only present in plants
Flagellum	Locomotion and sensory functions
Vacuole	Storage and maintaining homeostasis
Lysosome	Digestions of larger molecules
Peroxisome	Degradation of hydrogen peroxide
Ribosome	Synthesis of proteins
Proteasome	Break down of proteins with expired func



Microscope

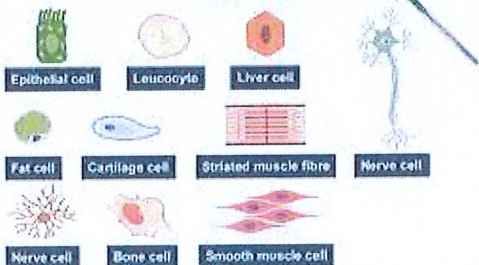


Required practical



Specialised cells

Add to your list in green pen



Equations for this topic

$$\text{Image Size} = \text{Actual Size} \times \text{Magnification}$$

Energy

Threshold Concept

Energy can't be created or destroyed, it can only be transferred from one store to another in a closed system

Keywords

Energy - moved between stores during transfers

Store - A temporary housing for energy

Transfer - The movement of energy between stores

Useful - The energy store that you wish for the energy to flow into

Dissipated - The store that energy flows into that is not useful or wasted

Movement between stores

Energy Transfer	Description
Mechanical	When a force acts on a body e.g. a collision
Electrical	Electricity can transfer energy from a power source, such as a cell, delivering it to components within a circuit
Heating	Thermal energy can be transferred by conduction, convection or radiation
Radiation	Light and sound carry energy and can transfer this between two points

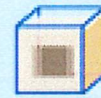
Energy Stores



chemical



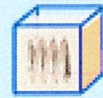
gravity



kinetic



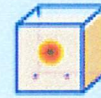
thermal



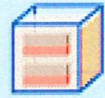
elastic



vibration

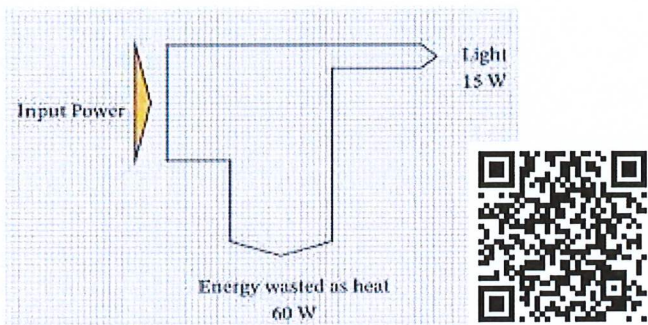


nuclear



electric-magnetic

Sankey Diagrams



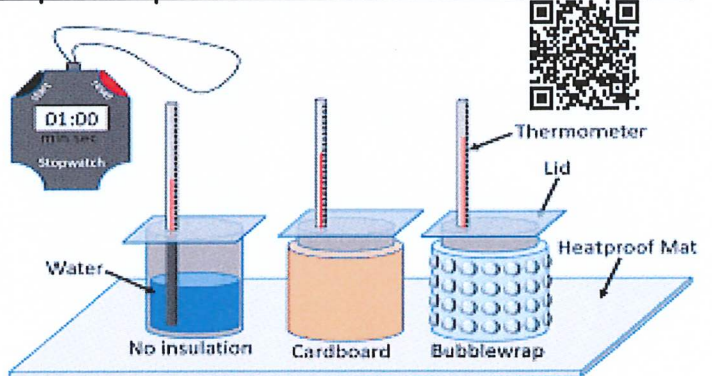
Conservation of energy

Law of Conservation of Energy

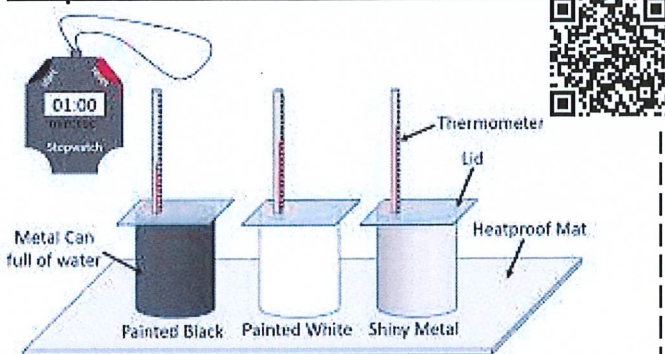
- Energy cannot be created or destroyed
- Energy may change form, but the total amount remains the same



Required practical - Thermal Insulation



Required Practical - Radiation



Equations for this topic

$$\text{Work} = \text{Force} \times \text{Distance}$$

$$\text{Power} = \frac{\text{Work done}}{\text{time}}$$

$$\text{Efficiency} = \frac{\text{useful energy output}}{\text{total energy input}}$$

Foundations of chemistry

Threshold Concept

All matter is made of particles

States of matter:



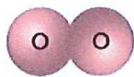
State	Solid	Liquid	Gas
Closeness of particles	Very close	Close	Far apart
Arrangement of particles	Regular pattern	Randomly arranged	Randomly arranged
Movement of particles	Vibrate around a fixed position	Move around each other	Move quickly in all directions
Energy of particles	Low energy	Greater energy	Highest energy
2D diagram			

Atoms and compounds:

Elements

contain just one type of atom.

Oxygen (O_2)



Compounds

contain different types of atom bonded together.

Carbon dioxide (CO_2)



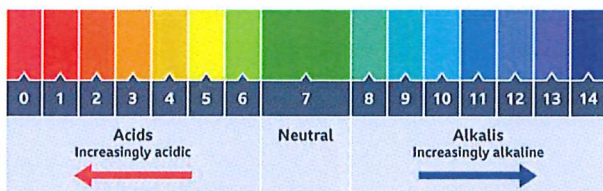
Pure substances:

Pure substances are made from only one chemical element or one compound.

For example, salt is a pure substance made only of sodium chloride.



The pH scale:

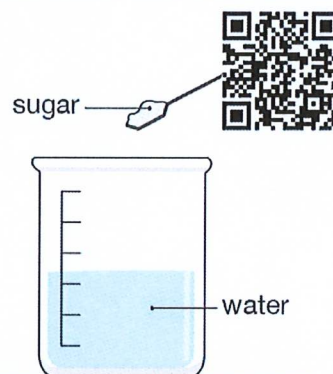


Keywords

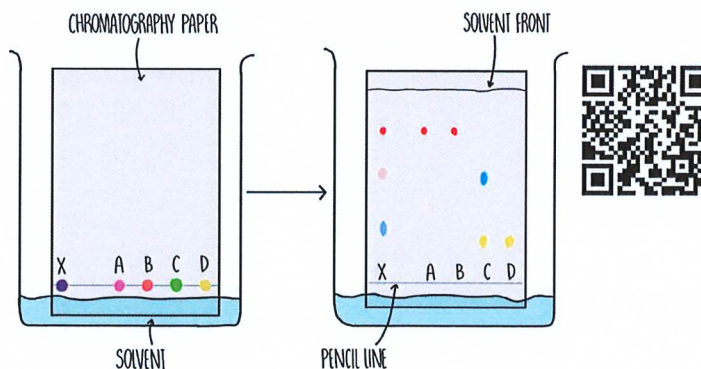
- **Particles:** The tiny things that all materials are made from. The smallest unit of matter.
- **Atom:** Atoms are the building blocks of all matter. Everything is made of atoms - even yourself. They are the smallest particle of an element, which are far too small to see.
- **Solid:** Have a fixed shape and cannot flow, because their particles cannot move from place to place, cannot be compressed (squashed), because their particles are close together and have no space to move into.
- **Liquid:** Flow and take the shape of their container, because their particles can move around each other, cannot be compressed, because their particles are close together and have no space to move into.
- **Gas:** Flow and completely fill their container, because their particles can move quickly in all directions, can be compressed, because their particles are far apart and have space to move into.

Solubility:

- Some solids dissolve in water to make a solution.
- These solids are soluble.
- A solution is made from a solute (usually a solid) and a solvent (liquid).
- Some gases, such as oxygen and carbon dioxide, can also dissolve in water.



Required practical: Chromatography



Equations for this topic:

$$R_f \text{ value} = \frac{\text{distance travelled by substance (B)}}{\text{distance travelled by solvent (A)}}$$