


- What should I already know?
- That there are three states of matter solid, liquid and gas.
 - That when electricity flows from a cell, into a bulb which lights up and back to the cell this is called a complete circuit.
 - About the water cycle and how evaporating water rises and condenses as the air cools to form clouds.
 - That puddles evaporate on warm sunny days.
 - That solid ice melts to form liquid water.


Scientific Learning


Solubility

Some materials **dissolve** in **water**. This means they **break apart** into **tiny pieces**, **spread out** in the **water** and can no longer be seen. This **mixture** is called a **solution**




soluble
(will **dissolve**)





insoluble
(will **NOT** dissolve)



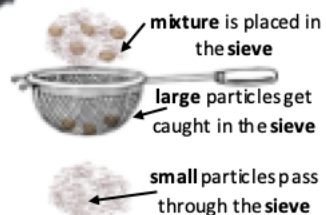
sand

Separating Mixtures

When **materials** have been **mixed** together, sometimes it is possible to **separate** them again (the mixing process can be **reversed**)

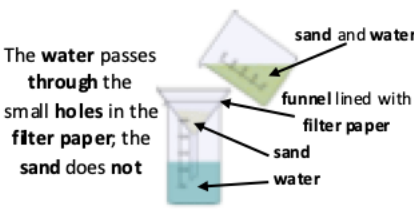
seiving

Use this **method** when there is a **mixture** of **different sized solids**.
For example: **sand** and **pebbles**



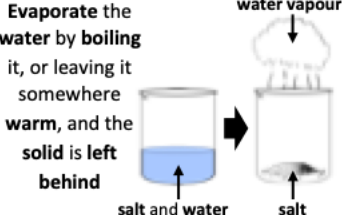
filtering

Use this **method** when there is a **mixture** of **liquid** and an **insoluble solid**. For example: **water** and **sand**



evaporation

Use this **method** when there is a **mixture** of **liquid** and a **soluble solid**. For example: **water** and **salt**



Reversible and Irreversible Changes


Some **changes** to **materials** can be **reversed**, while some **changes** cannot be **reversed**

reversible changes

This is a **change** that *can* be **undone**


MELTING

You can **melt** chocolate and then **reverse** the **change** by allowing it to **cool down**




FREEZING

You can **freeze** ice and then **reverse** the **change** by heating it



BOILING/EVAPORATING

The steam (gas) from a **boiling** kettle can be **turned back** into a **liquid** by **cooling** it (condensing)




irreversible changes

This is a **permanent change** (*can't* be **undone**)


HEATING/COOKING

If you **heat** a **raw** egg to **cook** it, the **cooked** egg **can't** be **changed** back into a **raw** egg (you can't get the **ingredients** back from a **cake** either!)



BURNING

When **wood** is **burned** you get **smoke** and **ash**. You **can't** change the smoke and ash **back into** **wood**



MIXING

Mixing substances like **bicarbonate of soda** and **vinegar** (an acid) creates a **chemical reaction** and **carbon dioxide gas** is created (bubbles). The gas and the leftover mixture **can't** be **turned back** into bicarbonate of soda and vinegar

A candle demonstrates both reversible (wax melting) and irreversible (wax burning) changes.

Properties of Materials

All materials can be grouped or compared according to their properties. These properties include

Opacity – how much light can pass through a material.

Magnetism – some metals containing iron are attracted to a magnet.

Hardness – a material is hard if it difficult to scratch.

Strength – a material is strong if it is difficult to break.

Flexible – a material is flexible if it bends easily without breaking.

Absorbency – A material is absorbent if it can soak up water.

Electrical Conductivity – A material is an electrical conductor if it allows electricity to flow through it easily.

Thermal Conductivity - A material is a thermal conductor if it allows heat to flow through it easily.

Flammable – A material is flammable if it can be easily set on fire.

What should I Know by the end of the unit?

- That a material be described using its properties which may include opacity, magnetism, hardness, strength, flexibility, absorbency, electrical conductivity, thermal conductivity, flammability.
- Sieving, melting, filtering, evaporating and magnetism can separate materials.
- Some metals are better conductors of electricity than others.
- All liquids will cool to room temperature but using a thermal insulator can slow the rate of cooling.
- That melting, freezing and boiling/evaporating are reversible changes.
- That Heating/cooking, burning and mixing are irreversible changes.

Vocabulary

| | |
|-------------------------|--|
| Opacity | how much light can pass through a material. |
| Magnetism | some metals containing iron are attracted to a magnet. |
| Hardness | a material is hard if it difficult to scratch. |
| Strength | a material is strong if it is difficult to break. |
| Flexibility | a material is flexible if it bends easily without breaking. |
| Absorbency | A material is absorbent if it can soak up water. |
| Electrical conductivity | A material is an electrical conductor if it allows electricity to flow through it. |
| Thermal conductivity | A material is a thermal conductor if it allows heat to flow through it easily. |
| Flammability | A material is flammable if it can be easily set on fire. |
| Transparent | An object can be seen clearly through a transparent material because all of the light can pass through. |
| Translucent | An object cannot be seen clearly through a translucent material because only some of the light can pass through. |
| Opaque | An object cannot be seen clearly through an opaque material because none of the light can pass through. |
| Soluble | A material is soluble if it can dissolve in water. |
| Insoluble | A material is insoluble if it cannot dissolve in water. |
| Solution | A solution is formed when a material dissolves in water. |
| Mixture | A mixture forms when a solid is mixed with water but does not dissolve. |
| Evaporation | Evaporation occurs when a liquid is slowly heated changes to a gas. |
| Boiling | Boiling occurs when a liquid is rapidly heated and changes to a gas. |
| Melting | Melting occurs when a solid is heated and changes state to form a liquid. |
| Freezing | Freezing occurs when a liquid is cooled so that it changes state to form a solid. |