



Year 4 - The Water Cycle Reading Booklet

Lesson Series:

1. States of Matter
2. Evaporation
3. Condensation
4. Precipitation
5. The Water Cycle

Name: _____

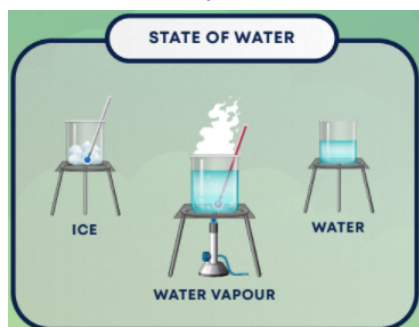
Class: _____

Lesson 1 - States of Matter

Water can exist in three states of matter: as a solid, liquid or gas. The water you drink is a liquid. When water is frozen it becomes a solid called ice. When you boil water in a kettle, it turns to a gas called steam, which is invisible. When steam moves away from the kettle where it had reached boiling point, it condenses into water vapour, which we can see. This water vapour is often known as steam, but scientists would call it water vapour. Scientists would describe steam and water vapour in simple terms as water in a gaseous state.



Useful link: <https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zsgwwxs>



Lesson 2 - Evaporation

Scientists use the word evaporation to describe a process where liquid water turns into water vapour, where tiny droplets of water are suspended (or hang) in the air. When evaporation occurs, liquid water changes to a gas. This happens naturally in the water cycle.



Evaporation can actually happen wherever there is water. On a warm day, after it has rained, puddles will slowly shrink. The water appears to be disappearing! What is happening is evaporation. The warmer the temperature, the faster water evaporates. At any given time, there are different amounts of water vapour in the air. A day with a lot of moisture in the air has 'high humidity'. A day with very little water in the air has 'low humidity'. On a hot summer day, if you are feeling sticky and uncomfortable it is probably because there is a lot of water vapour in the air. Some countries have far more humidity than others, particularly those close to large bodies of water, for example Indonesia and Singapore.

Useful link: <https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zydxmnb>



Lesson 3 - Condensation

Condensation is a process that happens in the water cycle, it is the opposite of evaporation. When condensation occurs, water vapour, which is a gas, turns into liquid. In the water cycle, condensation creates clouds. Within clouds, water vapour condenses into water droplets, liquid water, when these droplets grow too heavy to stay suspended in the cloud, they fall to the earth. So, within the cycle, condensation returns liquid water back down to the surface of the earth.

Condensation doesn't just happen in clouds, it happens wherever a gas cools and turns into liquid. There is water vapour in the air around us. If we take a cold can of drink from the fridge on a warm day, we might notice droplets of water on the outside of the can. This is not the can leaking, it is a result of warm air touching the cold can and the water vapour in the air condensing to form liquid water droplets.

Useful links: <https://www.bbc.co.uk/bitesize/topics/zkqg87h/articles/zydxmnb>



Lesson 4 - Precipitation

Clouds are made up of many tiny water droplets. When the water droplets grow in size, through the process of condensing, they get too heavy, they fall from the clouds as precipitation (most commonly rain).



Cirrus clouds are wispy and high in the atmosphere, they are formed of ice crystals. Cumulus clouds are fluffy and white, they are usually a sign of fair weather. Stratus clouds are layers of thin cloud that cover the sky. Cumulus and Stratus clouds don't often bring rain, but if they become nimbostratus or cumulonimbus, they are a much darker colour and bring rain.

Rain clouds are dark because the water droplets are close together and less light can travel through the cloud. Nimbus is the Latin word for a rain cloud. Precipitation can be rain, snow, hail or sleet. Define these and show images. Explain that the process of precipitation returns water, that has previously evaporated and then condensed, back to the surface of the earth. When hail falls, the water is frozen.



Lesson 5 - The Water Cycle

When water has returned to the surface of the earth as precipitation, it collects in rivers, lakes, streams and also underground. Collection is a process within the water cycle where water that falls as precipitation collects in various places according to where it lands. Some will land in or near waterways such as rivers and streams. Some will land on vegetation and will be used by plants. Plants and trees use groundwater, their roots absorb it from the soil. They also return water to the atmosphere through their leaves.

People collect water in reservoirs, artificial lakes made to create stores of water for us to use. We call this a water source. Once water is collected, the cycle continues as some water will change state as evaporation occurs. The sun plays an important part in the water cycle as it changes the temperature of water within the cycle. When temperatures are warm, evaporation happens at a faster rate, fuelling the cycle. When temperatures are very low, water within the cycle freezes. Glaciers are huge bodies of frozen water that move slowly over land. Show image. Explain glaciers are an example of water as a solid within the water cycle

Useful link: <https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z3wpp39>



KEY VOCABULARY

Cycle

A series of **events that repeats** in the same order

Solid

A state of matter e.g. ice. Solids **keep their shape** unless a force is applied

Liquid

A state of matter e.g. water. Liquids **take the shape of the container** that holds them. They can be poured

Gas

A state of matter e.g. water vapour. Gases **have no fixed shape**, they expand to fill the container they are in

Water vapour

When **water turns into gas**

Evaporation

A process where water changes state from a **liquid to a gas**

Condensation

A process where water vapour changes state from a **gas to a liquid**

Precipitation

The process of **water moving from clouds back to the surface of the Earth**. Condensation, and the force of gravity result in precipitation. Precipitation can be rain, hail, sleet, snow, hail

STATE OF WATER



ICE



WATER VAPOUR



WATER



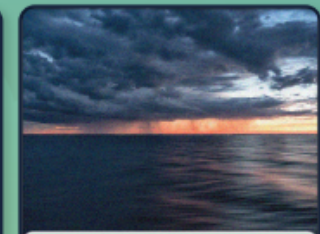
Cirrus clouds are white, thin, wispy, and high up in the sky. They are made of tiny ice crystals



Cumulus clouds are white and fluffy, they contain water droplets but are usually a sign of fair weather.



Stratus clouds are a thin layer of cloud that covers the whole sky



Nimbostratus clouds are dark and bring rain. The water droplets are closer together, letting through only a little light, so the clouds appear darker. "Nimbus" is the Latin word for rain cloud.