

States of matter

*Understanding evaporation,
condensation and the water cycle*

*Year 4
Age 8 - 9*

For parents

Thank you for supporting your child's learning in science.

Before the session:

- Please read slide 2 so you know what your child is learning and what you need to get ready.
- You may like to print page 7 as a worksheet.

During the session:

- Share the learning intentions on slide 2.
- Support your child with the main activities on slides 3-7, as needed.
- Slide 8 gives a further activity with slide 9 as an optional worksheet.
- Slide 10 has a glossary of key terms.

Reviewing with your child:

- Slide 11 gives an idea of what your child may produce.



States of matter

Understanding evaporation, condensation and the water cycle

Key Learning

- The **water cycle** is an example of **evaporation** and **condensation**.
- Water at the surface of seas, lakes and rivers **evaporates** into water vapour, a gas.
- Water vapour rises and cools. It **condenses** back into liquid water droplets which form clouds.
- When the water droplets in a cloud get too heavy, they fall as rain, sleet or snow. This is known as **precipitation**.

I can...

- make a model of the water cycle.
- evaluate how well the model shows evaporation, condensation and precipitation.

Activities (pages 3-7): 30 - 45 mins, plus time for your model to start working.

Household items to support learning:

- A glass and some ice cubes.
- Materials to make a model of the water cycle (three options – see page 6).

Use lined paper and a pencil. *Alternatively may wish to print page 7 as a worksheet.*



Taking it further... (page 8-9)

- You may like to write a short story or make an illustrated story board to describe the journey of a water droplet in the water cycle.



Explore, review, think, talk...

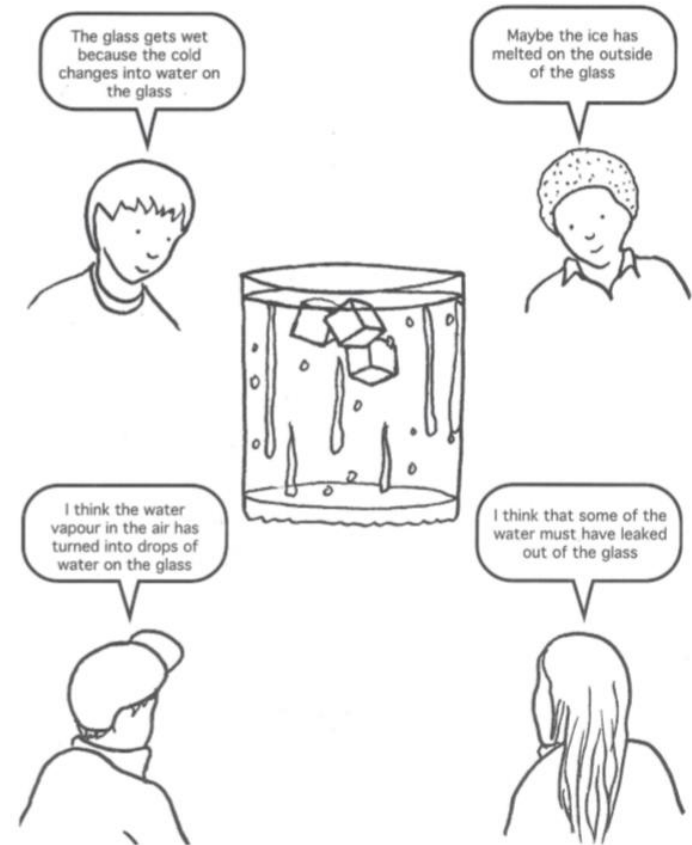
What do you already know about condensation?
(5 minutes)

- Find a glass and fill it with cubes of ice.
- Top up the glass with water.
- Wait for five minutes.
- *What do you notice?*



Which of these children do you agree with?

Do you have
another
idea?



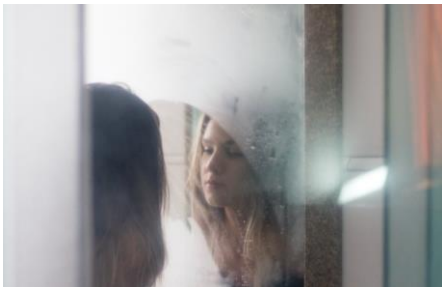
Concept Cartoons, 2000.
Reproduced courtesy of
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Evaporation and condensation

Understanding how water evaporates and condenses
(10 minutes)

- **Water vapour** is an invisible **gas**. There is a small amount of water vapour in the air all around us.
- The outside of a glass of iced water is cold, so some of the water vapour in the air can cool and **condense** into tiny droplets of water.
- Where else can you sometimes see '**condensation**'?

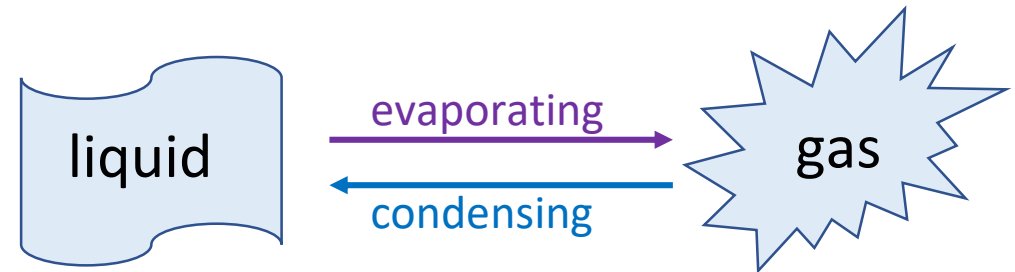


a bathroom mirror



dew on a cool morning

- How does water vapour get into the air?
Watch this clip:
<https://www.bbc.co.uk/bitesize/topics/zkkg87h/articles/zydxmnb>



Evaporating and condensing are changes of state.

- Liquid water is *warmed up* and changes to an invisible gas, water vapour.
- Water vapour can *cool down* and change back to water droplets.



The water cycle

*Investigating and modelling the water cycle
(20-30 minutes, plus time for your model to start working)*

Watch these two BBC
bitesize clips:

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

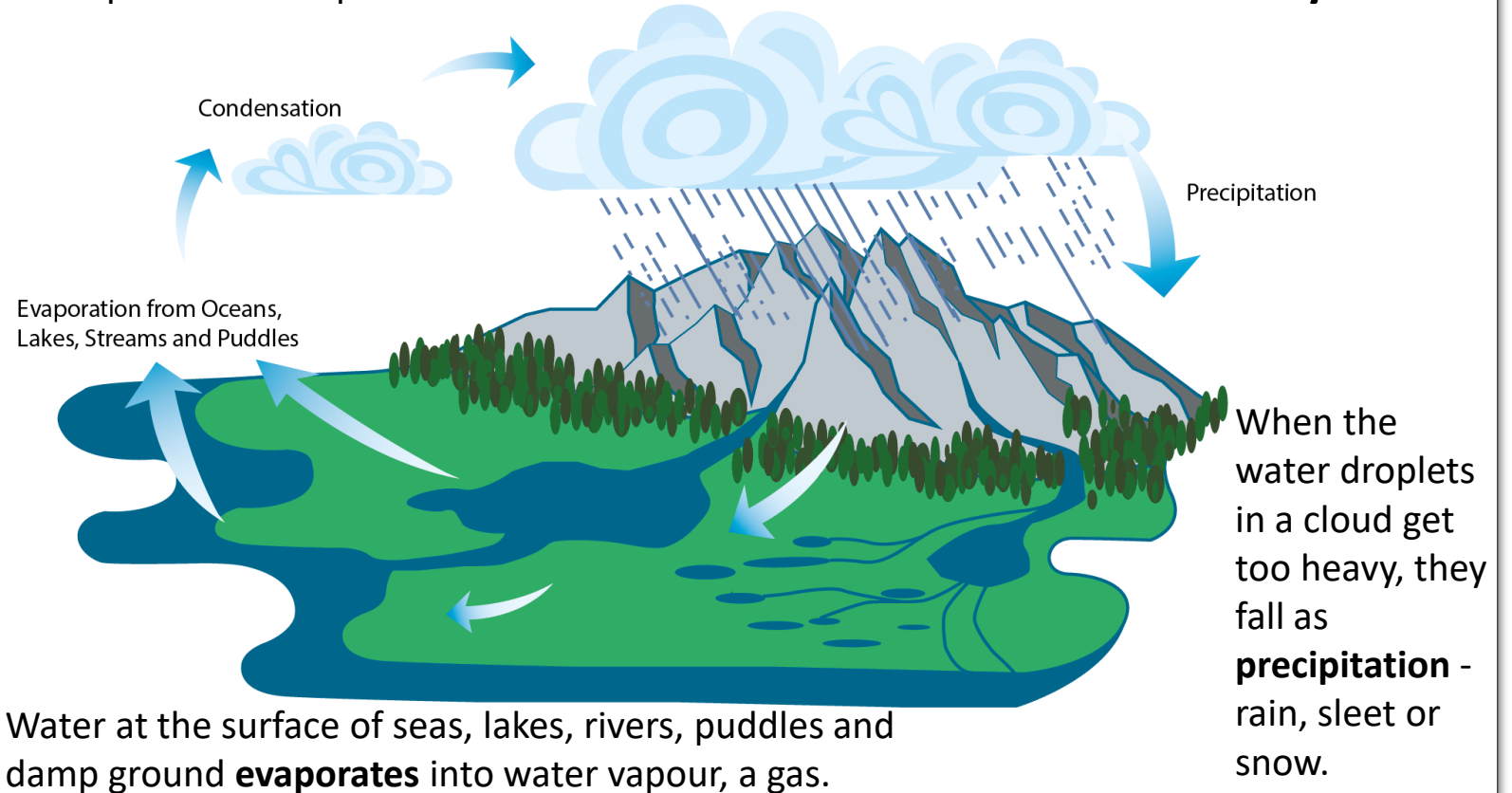
<https://www.bbc.co.uk/bitesize/clips/zh4rkqt>

The water cycle is an example of **evaporation** and **condensation**.



Water vapour rises and cools. It **condenses** back into liquid water droplets which form clouds.

The Water Cycle



You can make different water cycle models. **Ask an adult to help you.** Choose **one** of these options:

In a bowl

You will need:

- an empty transparent bowl
- an empty cup or mug
- cling film
- warm water

1. Pour some warm water into a bowl (about $\frac{1}{4}$ full).
2. Put an empty cup in the middle.
3. Cover the bowl with clingfilm.
4. Stand it in a warm place.
5. Observe throughout the day.



In a plastic bag

You will need:

- a sealable plastic bag
- a marker pen
- sticky tape
- warm water

1. Draw a diagram of the water cycle on your bag using a marker pen.
2. Pour in a small amount of warm water.
3. Seal the top with tape/zip.
4. Stick it to a sunny window.
5. Observe throughout the day.



You might like to add blue food colouring to the water.

In a glass jar

You will need:

- a small empty glass jar
- kitchen foil
- 3 ice cubes
- warm water

1. Pour some warm water into a glass jar (about $\frac{1}{4}$ full).
2. Cover the top with some kitchen foil.
3. Put three ice cubes on top of the foil.
4. Stand it in a warm place.
5. Observe throughout the day.



I can make and evaluate a water cycle model. (You may like to take a photograph or draw and label a sketch.)

Write a paragraph to evaluate how well your model represents the water cycle.

Key words: evaporation / evaporates, condensation / condenses, precipitation, water vapour, water droplet, cloud, rain, sleet, snow, sea, lake, river, puddle.

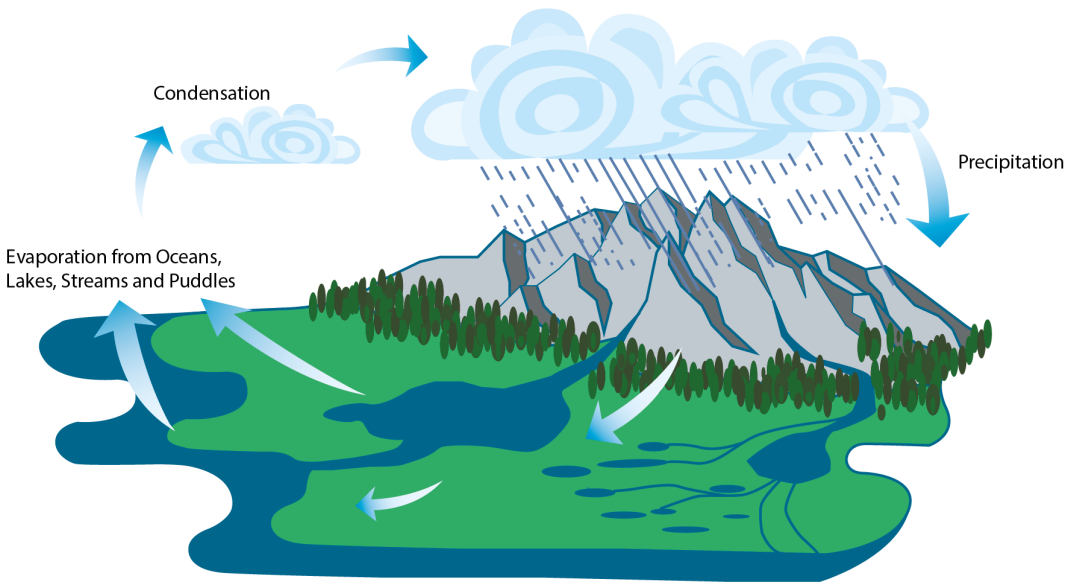


Taking it further...

Write a short story or make an illustrated story board

Read this description of the water cycle in DK find out.

<https://www.dkfindout.com/uk/earth/water-cycle/>



- Imagine you are a droplet of water.
- Write a short story to describe your journey round the water cycle.
- You may like to create an illustrated story board using the template on page 9.

Glossary of terms

States of matter: There are three **states of matter**: **solid**, **liquid** and **gas**.

Change of state: Liquids can change from a liquid to a gas. This is a **change of state**.

Condensation: **Condensation** is a change of state when a gas is cooled and changes to a liquid.

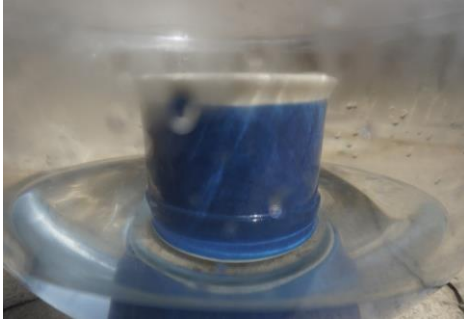
Evaporation: **Evaporation** is a change of state from liquid to gas which can happen **at any temperature** and only at the surface of the liquid.

Precipitation: When the water droplets in a cloud get too heavy, they fall as rain, sleet or snow. This is known as **precipitation**.

Water cycle: The **water cycle** is the continuous process of evaporation, condensation and precipitation of the Earth's water.

No model is a perfect representation. Your evaluation should mention where the model shows clear aspects of the water cycle. You should also highlight some of your model's limitations.

You may like to suggest an improvement to the model. For example, adding an ice cube on top of the cling film would help cool the water vapour so it condenses more rapidly.



I can evaluate a model of the water cycle

Model 1 - Bowl, mug and clingfilm

The water at the bottom of the bowl represented the sea with the mug in the middle as dry land. It would have been better to have a cone shape as the land and it was hard to see it.

After a while, water droplets formed on the underneath of the cling film showing condensation, so I knew some of the water had evaporated and then condensed. The cling film was like a cloud layer but it was flat instead of deep cloud.

When I tapped the cling film the water droplets fell off into the bowl. This showed precipitation as rain. It was not cold enough to make snow! There was also water running like rivers and streams down the sides of the bowl.

At the end, I took off the cling film and found some water in the mug. This was like a puddle of water after raining.

It took a long time to work. Next time I would try putting an ice cube on top of the cling film to help cool down the water vapour faster.