



Making rain

Investigating how rain falls from clouds

Subject(s): Science

Approx. time: 25 - 40 minutes

Key words / Topics:

- > Air
- > Clouds
- > Rain
- > Water cycle
- > Water droplets
- > Water vapour

Suggested Learning Outcomes

- > To describe how clouds are formed.
- > To understand what causes rain to fall from clouds.
- > To use shaving foam and food colouring to investigate how rain falls from clouds.

Introduction

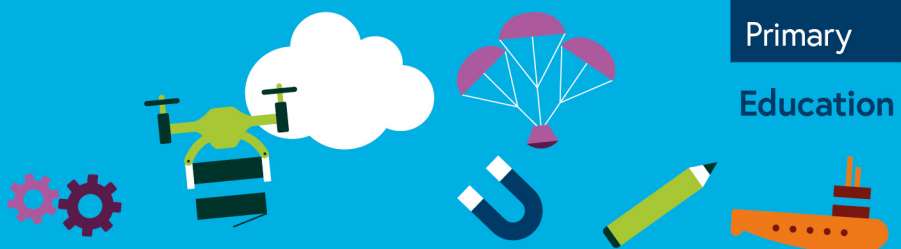
This is one of a set of resources developed to support the teaching of the primary national curriculum. They are designed to support the delivery of key topics within maths and science. This resource focusses on investigating how rain falls from clouds.

We often complain about rain when it gets us wet, but do you know what causes it to fall?

Purpose of this activity

In this activity learners will perform an experiment to investigate how rain falls from clouds. They will spray shaving foam on top of a glass of water to create a 'cloud'. They will then add food colouring and watch as the cloud fills up, producing 'rain', and discuss their findings as a class.

This activity could be used as a starter or main activity to introduce the causes of rain, or as one of several activities within a wider scheme of learning focussing on seasonal changes and the weather.





Activity

Introduction (2-5 minutes)

Teacher to explain that learners are going to perform an experiment to investigate how rain falls from clouds. Teacher to hand out equipment needed for the task to learners.

Performing the experiment (10-20 minutes)

Teacher to demonstrate the steps shown in the teacher presentation and listed below.

- > Step 1 - pour water into your glass until it is about three quarters full.
- > Step 2 - spray shaving foam on top of the water and allow it to settle. This is the 'cloud'.
- > Step 3 - using a pipette, squirt the food colouring on top the shaving foam 'cloud' and observe what happens.

Learners to complete each step to conduct the experiment for themselves. The teacher presentation could be left on the whiteboard as a supporting guide as they do this.

Discussing the results of the experiment (10-15 minutes)

Learners should observe the 'cloud' filling up and the food colouring then falling into the water in the glass.

Teacher to discuss the results of the experiment with learners. Teacher to explain how real clouds form and what causes rain to fall from them.

Teacher notes

Pouring water into the glass

If there is not easy access to a sink/tap then this step could be done in advance with glasses pre-filled with water. A glass or plastic jar or vase could also be used instead as long as it has an open top.

Creating the 'cloud'

Spray enough shaving foam so that there is a good covering on top of the water and at the top of the glass. Try and make the shaving foam look like a cloud!

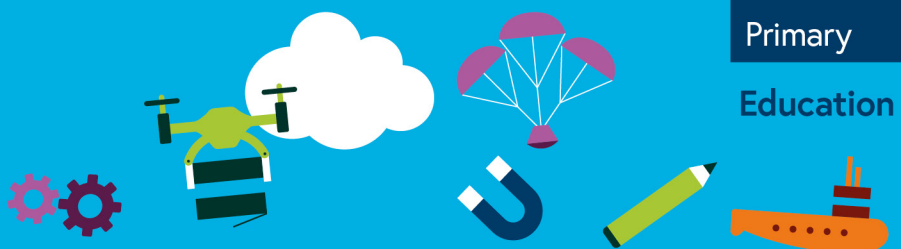
Creating rain

If the food colouring does not come with a pipette, then a separate one will need to be sourced. The food colouring needs to be added as gently as possible – dripping works, but pressurised squiring may cause the colouring to pierce the shaving foam cloud and enter the water directly.

The 'cloud' should 'fill up', followed by the food colouring falling into the water, just like rain falling from a real cloud! Use brightly coloured food colouring for a really clear and interesting visual effect!

Explain to the learners that clouds form when water vapour rises into the air. When this vapour comes into contact with cold air, water droplets are formed and they then link together to create clouds. Eventually the clouds become so full of water that they cannot hold it anymore, and so the water falls back to the ground – this is rain.

The following Met Office video explains this well:
<https://www.youtube.com/watch?v=zBnKgwnn7i4>





Differentiation

Basic

Walk through the experiment with learners step by step, so they complete each stage as it is demonstrated.

Pre-fill the glasses $\frac{3}{4}$ full with water.

Resources

- > Drinking glasses
- > Access to a sink and/or source of water
- > Shaving foam
- > Food colouring
- > Pipettes

Additional websites

- > **YouTube – Met Office weather:** Video explaining how rain forms and what is meant by the water cycle. <https://www.youtube.com/watch?v=zBnKgwnn7i4>
- > **Bitesize – The water cycle:** Class clips video explaining how the water cycle works. <https://www.bbc.co.uk/bitesize/clips/z8qtfq8>

Related activities (to build a full lesson)

Starters (Options)

- > Discuss what is meant by rain.
- > Ask learners to state three things they already know about clouds and/or rain.

Extension (Options)

- > Research and investigate how rainfall varies across the four seasons e.g. when is it at its highest/lowest?
- > Discuss the effects of too much rainfall e.g. flooding and the problems this can cause.
- > ACTIVITY – half empty or half full?

Plenary

- > Discuss the outcome of the experiment and how this relates to 'real life' clouds and rainfall.
- > Show the following Met Office video explaining the water cycle. <https://www.youtube.com/watch?v=zBnKgwnn7i4>
- > Missing word activity describing how clouds form and how rain is produced.

Extension

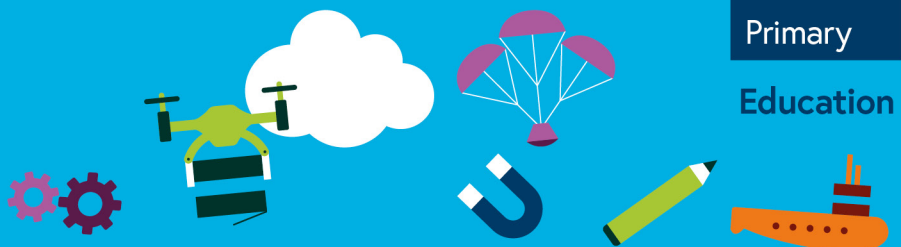
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Required files



Teacher presentation – Making rain





The Engineering Context



- > A good knowledge and understanding of how the climate works helps us to know where protection against rainfall is needed, for example when building homes, or where to place precautions against flooding.
- > Environmental engineers are tasked with improving the quality of the natural environment around them. The more they understand about this, the better they can do their jobs.

Curriculum links

England: National Curriculum

Science

KS2 Year 1 Seasonal changes:

- > observe and describe weather associated with the seasons.

Scotland: Curriculum for Excellence

Sciences

Processes of the planet:

- > SCN 1-05a
- > SCN 2-05a

Northern Ireland Curriculum

KS2 – The world around us

Place:

- > features of, and variations in places, including physical, human, climatic, vegetation and animal life.

Wales: National Curriculum

Foundation phase – knowledge and understanding of the world

Places and people:

- > investigate how places change, e.g. the weather.

Assessment opportunities

- > Formal teacher assessment of experiment results.
- > Formal teacher assessment of practical Science skills through observation of learners.

