



Water

Curriculum Links:

- **Science** Living things
Environmental awareness and care
- **Geography** Human environments
- **SPHE** Myself and the wider world

Lesson objectives:

To explore the water cycle in detail and to learn the different phases that occur. To appreciate the farmer's role in producing renewable energy.

Teacher guidelines

It is suggested that teachers ensure that students are familiar with the vocabulary and concepts introduced in the previous modules before starting this lesson.

Keywords and concepts introduced in previous modules:

water vapour fences manure food chains

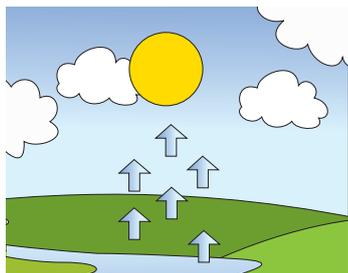
Like in the hedgerow, food chains exist in water. The farmer protects these food chains and all the animals on the farm by ensuring that there is clean water. The farmer puts fences around the waterways and is very careful when he or she is spreading manure.

Keywords for this lesson:

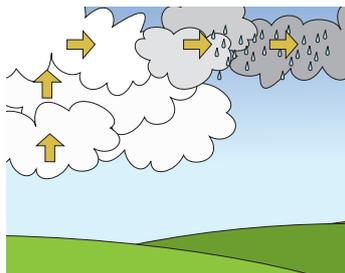
evaporation condensation precipitation mechanical energy electrical energy

The water cycle on the farm

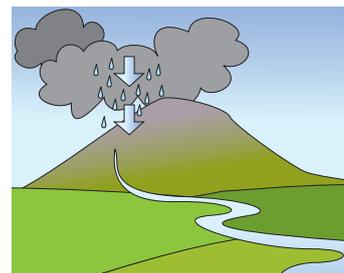
Water on the farm goes around in a cycle. Sun heats water on the ground and turns it into water vapour or steam, this is called **evaporation**. This water vapour then rises into the sky and forms clouds, as the clouds get higher and higher they get colder and so the water vapour changes back into drops of water. This process is called **condensation**. When the clouds get very heavy and full, they began to leak and these drops of water then fall back to the ground as rain, this is called **precipitation**. This cycle is continuous.



Evaporation



Condensation



Precipitation

Renewable energy

Water is all around us and is constantly being re-formed (think of the water cycle). As such, it is an excellent source of renewable energy. We have already learned in Module 3 – 'Air and Trees' that renewable energy such as water and wind energy, are more environmentally friendly than non-renewable energy e.g. coal and oil. Irish farmers are very aware of this so they use renewable energy as much as possible. This is why some Irish farmers now have watermills on their farm to produce electricity. Water will become increasingly more important energy resource as the amount of non-renewable energy sources deplete over time.

Creating energy

How is renewable energy made? Think of the force of a really strong wave, this moving power is called tidal energy and it is so strong that it can generate **mechanical energy**. Mechanical energy is the energy of motion to perform work, this mechanical energy is then converted into **electrical energy** or electricity.

Wind energy works in the same way, getting its force from strong gusts of wind. There are many advantages for farmers who can either create water or wind energy on their farm or obtain it from a nearby source, it is good for the environment and helps the farmer to save money.

Why renewable energy?

- Wind and water energy is clean
- Wind and water energy is safe
- Wind and water energy is renewable, meaning it can never run out
- It is a secure and stable long term energy supply
- The farmer knows that it is cheaper and more environmentally friendly to generate water or wind electricity on the farm, than buying coal, natural gas or any other expensive type of fuel to generate energy.



Suggested activities

- Complete the activity sheet, on page 55
- Write a poem with all the new words you have learned from the water cycle such as precipitation, evaporation and condensation
- Match these words with their everyday comparisons

Evaporation	falling water
Condensation	just like heating water in a kettle
Precipitation	just like steam in the bathroom hitting the mirror
- Discuss the different types of machines powered by wind or water in class
- Discuss how water can create enough force to move a water mill and create energy
- Get the class to set up their own water cycle by putting a saucer of water beside the classroom window and putting one in a fridge also. Measure the amount of water that is present in the morning and again in the evening. Compare this to the saucer in the fridge
- Get the class to do an experiment to show that all living things need water. Get two flower pots and plant broad beans in each. Water one each day but do not water the other. Keep all the conditions the same and within a few days or weeks, the students will see that the plant without water has died
- For extension material, see Module 4

Learning outcomes:

At the end of this lesson, students should know about evaporation, condensation, precipitation and renewable energy.

Additional resources:

- www.agriaware.ie



Water

Name: _____

Date: _____

1 Draw each stage of the water cycle in the correct box

Evaporation

Condensation

Precipitation

2 Which of the following are renewable sources of energy?

Coal _____

Water _____

Gas _____

Oil _____

Wind _____

*To be used with teacher guidelines, page 30