



# Water harvesting

There are many places on Earth where water is in very short supply and some people do not have access to clean, fresh water. As populations increase and climate changes, this situation is becoming worse. Scientists are therefore trying to find ways to harvest water from the air and turn this into drinking water using energy from the Sun.

## ACTIVITY

Which material holds the most water?



## ACTIVITY OVERVIEW

Before the activity, show a short film of the scientists explaining the water harvesting box (use the QR code to access the film). Explain that the activity will be to understand better how different materials can take up different amounts of water.

Show the children a variety of different absorbent materials such as sponges and cloths. Demonstrate how you can soak the sponge, squeeze its contents into a container to measure the volume of water that the material held. Challenge the children to find out which material holds the most water.

Optional: Powdery hydrogels can easily be extracted from a baby's nappy. Tear open the padded area and carefully shake out the powder. This material typically hold 300x its mass of water. Children could explore how much water a given quantity of hydrogel (e.g. 5ml) can take up.

## KEY FACTS/SCIENCE

**Water vapour** (the gaseous form of water) is present in the air, even in dry climates. It is invisible.

**Condensation** is the process where water vapour turns to liquid water. This can happen in two ways: either the water vapour is cooled (e.g. when you see water droplets forming on the outside of a cold glass), or when a pocket of air becomes full of water vapour or *saturated* (e.g. when rain falls from a cloud).

Scientists have created a substance called a **metal-organic framework (MOF)**. During the night when it is cool, water vapour in the air cools, condenses and sticks to the MOF. The next day, the Sun's energy releases the water vapour from the MOF. When enough water vapour is released into the box the air becomes saturated and some becomes liquid water (condenses).

## RESOURCES

### MAIN ACTIVITY

access to water

a variety of absorbent cloths and sponges  
beakers/jugs/syringes/measuring cylinders

### OPTIONAL ACTIVITY

the resources above

nappies (different manufacturers could be compared)  
scissors & spoons - to extract the gel  
weighing scales (suitable for 5g)

## QUESTIONS FOR LEARNING

- How much water did the materials you tested take up? Which material takes up the most water and why?
- How do you think the scientists could improve their water harvester?

