# Year 7 Lesson 3 Moisture from the Earth

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## Learning Objectives

Students will be able to:

- Gain insight into the process of condensation by undertaking a series of investigations
- Speculate on observations and communicate ideas and evidence using appropriate scientific terminology.

## Learning outcomes

| Outcomes Subject | Strand & Content Descriptors |
|---|---|
| Science | Science Understanding<br>• Water is an important resource that cycles through the environment (ACSSU222)<br>Science as a Human Endeavour<br>• Science knowledge can develop through collaboration and connecting ideas across the disciplines of science (ACSHE223)<br>• Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations (ACSHE120)<br>• Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management (ACSHE121)<br>Science Inquiry Skills<br>• Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS124)<br>• Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (ACSIS133) |

## Focus Questions

What is condensation; what is its role in the water cycle?

How will variables such differing surface environments and temperature affect the rate of condensation?

## Lesson Plan

Condensation is a part of everyday life. It appears on the inside of car windows and on the outside of drink bottles. This simple exploration looks at heat and how it affects condensation and transpiration.

1. Give each group five clean jars - number the jars 1, 2, 3, 4 and 5.

2. Move outside to a sunny location with moist soil, lawn and small plants close to a concrete path.

3. Stand jar 1 upside down on the cement path, jar 2 upside down on grass, jar 3 upside down over a small plant or weed, jar 4 upside down on moist soil and jar 5 upside down in a saucer of water.

4. Carefully watch what happens in each jar and record observations in a data table (see below).

5. Time needed to observe depends on local conditions and there may be no observable differences between some jars. In most cases 15 minutes should be adequate. This activity is best done between 9am and 10am.

| Jar | Over | Describe observation (what did you see?) |
|---|---|---|
| 1 | Concrete | |
| 2 | Grass | |
| 3 | Weed | |
| 4 | Moist soil | |
| 5 | Saucer of water | |

6. Guide observations by asking questions.

   - In which jar did water droplets first appear?
   - Where do you think the moisture came from? Why do you think there is more water in some jars than others?
   - Which jar contains the least water? Why do you think this is so?

7. Encourage students to feel the moisture with their fingers.

8. Wipe two glasses dry. Invert one on lawn in the shade and one nearby on lawn in the sun. In which jar does the moisture first appear? (Students should be able to infer that heat energy from the sun causes some of the water in grass to change to a vapour).

9. Encourage students to make inferences such as: a lot of moisture rises into the air on a sunny day, seas and oceans use a lot of water in one day, rain and rivers replace the water that oceans lose.

10. Repeat the activity at home to determine high and low moisture areas.

## Resource Requirements

- Glass jars
- Clean cloth
- Saucer

## Additional Activities – Cloud in a Bottle

This activity demonstrates condensation by creating a cloud in a bottle.

1. Fill a plastic soft drink bottle with just enough warm water to cover the bottom.
2. Strike a match, let it burn and then blow it out. Hold the match inside the bottle, tilt the bottle and allow the smoke to fill the bottle.
3. Without squeezing the sides of the bottle, screw the cap onto the bottle.
4. Squeeze the sides of the bottle hard three or four times. Each time wait a few seconds, and squeeze the bottle again, holding the squeeze for longer each time.
5. Behold – a cloud in a bottle

Clouds are formed when pressure is reduced as warm air rises and lower pressure allows the air to cool down and water vapour creates clouds. When the bottle is squeezed the gas is compressed and its temperature rises – releasing the squeeze allows the gas to expand and cool.