ACTIVITY OVERVIEW 2: EVAPORATION RATES PRACTICAL

Overview

In this activity students investigate how the amount of evaporation is affected by the surrounding temperature. They do this by observing water loss in two different places: one warm and one cold. They will then go on to use their observations to help them interpret data about evaporation rates from the sea.

Resources

Each group of students need:

- 2 sticky notes
- 2 petri dishes / watch glasses / jam jar lids
- A spoon or pipette
- 10ml of water in a small container (eg a yoghurt pot)
- 2 class trays (optional)
- Prearranged warm and cold locations

Time

- Set up: 5 mins
- Running: 30 mins or longer

Before the lesson

Identify a suitably warm and cool place (eg on top of a radiator and on a window sill). If you cannot find a place in your classroom, arrange another place, eg outside, the staff room fridge, or another classroom with a better radiator.

Health and safety

Hazard	Risk
Cutting injuries from broken glass	Medium
Precautions	
- Students should carry watch glasses with two hands, carefully observing the environment around them - You may want to ask students to place the dishes in the environments before adding the water, depending on how likely they are to drop things - Spills should be reported to an adult immediately	

Hazard	Risk
Slipping on water	Low
Precautions	
- Students should carry watch glasses with two hands, carefully observing the environment around them - Breaks should be reported to an adult immediately, and students should not attempt to clear these themselves	

Hazard	Risk
Tripping over the trays	Medium
Precautions	
- Ensure that trays are placed out of the way and clearly signed	

Running the activity

Stage 1 – set up

1. Outline aim of the activity to students.
2. Outline the safety instructions.
3. Indicate the warm and cool places. If you are using trays to take the dishes somewhere else, point them out and clearly label them.
4. Give each pair of students their equipment.
5. Ask them to write "warm" on one sticky note and "cold" on the other.
6. Ask them to write both their names on the sticky notes.
7. Ask them to add a teaspoon (about 5ml) of water to each of their dishes.
8. One partner takes one of the dishes and the sticky notes labelled "warm" and takes it to the warm place / tray.
9. The other partner takes the other dish, the sticky note saying "cold" and takes it to the cold place / tray.
10. If you have used trays, send a pair of students with an adult to the prearranged place, with clear safety instructions.
11. Set the timer for about 30 minutes.
12. Ask students to predict what they think will happen and why.

Stage 2 – Waiting for changes

13. Leave the dishes for 30 minutes.
14. Continue with the next portion of the lesson.

Stage 3 – observation and analysis

15. After 30 minutes, or when you have finished with the other lesson activities, return the dishes to the students and ask them what they can observe. They should notice that the dishes in the warmer conditions have lost more water.
16. Ask students to consider the following questions:
    a. "Water evaporates faster in warmer conditions." How does your experiment support this conclusion?
    (The dish in the warm place lost more water.)
    b. "Water boils at 100°C". Does the experiment support this conclusion? Why?
    (We can't tell because we didn't use 100°C and we didn't look for boiling.)
    c. What could be done to improve the experiment?
    (Measure the water out precisely with a measuring cylinder, measure the change in mass of the water, use a thermometer to measure the surrounding temperature, use more places, repeat the experiment.)