

Changes in Moisture



Focus: Students will explore changes in location, amount, and form of moisture, and communicate with others as they are exploring.

Specific Curriculum Outcomes

Students will be expected to:

- 11.0 explore changes in the location, amount, and form of moisture [GCO 1/3]
- 12.0 communicate while exploring and investigating [GCO 2]

Performance Indicators

Students who achieve these outcomes will be able to:

- describe where liquid water comes from and where it goes during explorations of evaporation and condensation

NOTES:

Attitude Outcome Statements

Encourage students to:

- be open-minded in their explorations [GCO 4]

Cross-Curricular Connections

English Language Arts

Students will be expected to:

- speak and listen to explore, extend, clarify, and reflect on their thoughts, ideas, feelings, and experiences [GCO 1]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• Science Card 5 • IWB Activity 5 • BLM <i>Concept Diagram</i>	• paper towel • pencils or markers • wet towels or bowls of water • students' Science Folders • two identical containers (ideally metal cans) • water and ice • students' Science Journals • plastic wrap • ice cubes or snow • warm water • metal tray or pie plate • large glass jar with a wide mouth • digital camera (optional) • coloured paper • paint brushes (optional)	• Collect some ice cubes or snow.	• evaporation • condensation

Science Background

- Evaporation is the process of water leaving the liquid phase and entering the gas phase. Evaporation occurs even at low temperatures, such as when a glass of water is left out at room temperature. The rate of evaporation increases with temperature.
- Condensation is the process of water leaving the gas phase and entering the liquid phase. When water vapour comes into contact with a sufficiently cold substance, the water vapour enters the liquid phase, or condenses.
- Sometimes, water will go directly from a gas to a solid and form frost, in a process called deposition. Deposition can only occur when air is saturated (contains all the moisture it can hold) and the temperature is below 0° C. Snowflakes are also formed by deposition.

Possible Misconceptions

- Students may think that evaporating water simply disappears or moves in some way or by some agent while staying a liquid. It can be helpful to explore the word “disappearing” with the class. For example, ask a student to step into the hall and then ask the class if the person has disappeared or gone somewhere else. When students observe evaporation, ask if the ‘missing’ water disappeared or went somewhere else, and to explain their thinking.
- Students may imagine condensation as some sort of transformation from one substance to another, such as liquid water becoming air (without a concept of water vapour). Other common misconceptions are that condensation is water leaking out of the container, or that air becomes liquid. To challenge these ideas, have students review what they found out or observed about freezing and melting, and then ask them to describe the relationship between water and ice.

ACTIVATE



Getting Dry

Share Science Card 5 with the class. Have students suggest answers to the questions on the card. Add their ideas to the unit KWLN chart. Prompt deeper thinking by asking:

- Is water always a liquid?
- Can you think of any other examples of something that we dry?
- What happens to the moisture when items are dried? (evaporation)

IWB Activity:

- Have students use
- IWB Activity 5:
- *Dry it out!* (see the
- Teacher's Website) to
- match wet items with
- the method of drying.

 A small graphic showing a grid of various items (like a shirt, a towel, a dish, etc.) and different drying methods (like hanging, using a dryer, etc.) for a matching activity.

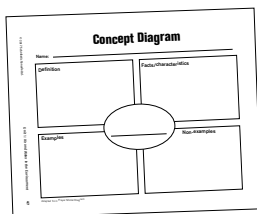
CONNECT

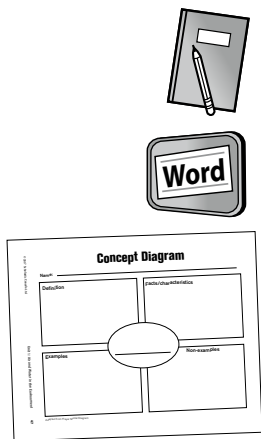
My Disappearing Hand

Provide each student with a paper towel and a pencil or marker. Tell students to place one hand on the paper towel and trace it with the other. Then, provide a way for students to wet the hand they traced, such as a wet towel or a bowl of water. Have students place their wet hand inside the tracing, which should leave a handprint within the outline. Invite students to predict what will happen to their handprint. Record their predictions.

Have the students observe their paper towel again when the handprints have at least partly dried. Ask them to tell you what has changed and if it was what they predicted. Introduce the word “evaporation” and add it to the Word Wall. Explain that when water seems to disappear like it did in their handprint, we call that evaporation. Note: you may wish to start the demonstration *It Got Wet!* as you wait for the handprints to dry.

Provide students with a copy of BLM *Concept Diagram*. Have them fill it in using the word “evaporation.” Invite students to share their diagrams with a partner. Completed BLMs can be stored in the students’ Science Folders.





It Got Wet!

Gather the class around a table. Place two identical containers (metal cans, if possible) of water on the counter and add ice to one. Invite volunteers to touch the sides of the containers and share any differences they feel. Then, let the containers sit until condensation forms on the container with the ice. You may want to complete the activity *My Disappearing Hand* in the meantime. When water has condensed on the container with ice, invite volunteers to touch both the containers and share any differences. Have students record their observations in their Science Journals.

Ask students for their ideas about where the water came from. Add these to the unit KWLN chart, along with any questions student generate. Introduce the word “condensation” and add it to the Word Wall. Explain that when water seems to appear, like it did on the container, we call that condensation. Provide students with a copy of BLM *Concept Diagram*, and have them fill it in using the word “condensation.” Invite students to share their diagram with a partner.

Open and Closed

Bring the class together to observe what you are doing. Place two identical containers with the same amount of water in each somewhere in the classroom where you can safely leave them for a few days. A sunny window would be ideal. Cover one container with plastic wrap, and leave the other one open. Invite a volunteer to draw a mark on each container to show the level of the water, or mark them yourself. You could also take a digital photo of the containers. Every day for the next few days, observe the two containers as a class, and ask students to describe any changes they notice in the containers. Take pictures or have students draw their observations in their Science Journals each day. Students will observe that the water level in the open container falls, while that in the closed one stays the same. They should also see water droplets on the plastic wrap. You might use different coloured markers to mark the new water level each day.

If you took pictures, post them in the classroom. As a class, review what was observed and brainstorm an explanation. Prompt students by asking questions such as:

- Did evaporation happen? In which one? What is the evidence?
- Did condensation happen? In which one? How do you know?

CONSOLIDATE

Foggy Days

Display some ice cubes or snow, warm water, a metal tray or pie plate, and a large glass jar with a wide mouth. Gather the class to watch you, and tell them that you are going to make fog. Pour warm (not boiling) water into the jar to a depth of about 2 cm. Place the ice cubes or snow on the metal tray or pie plate, then set the whole thing on the open mouth of the glass jar. As the students watch, the warm moist air in the glass jar will rise and condense against the cold metal surface, forming a fog-like mist.



Have the students make drawings of their observations in their Science Journals. Challenge them to show on their drawings where they think water is evaporating and where it is condensing. Ask them to explain their choices.

EXPLORE MORE

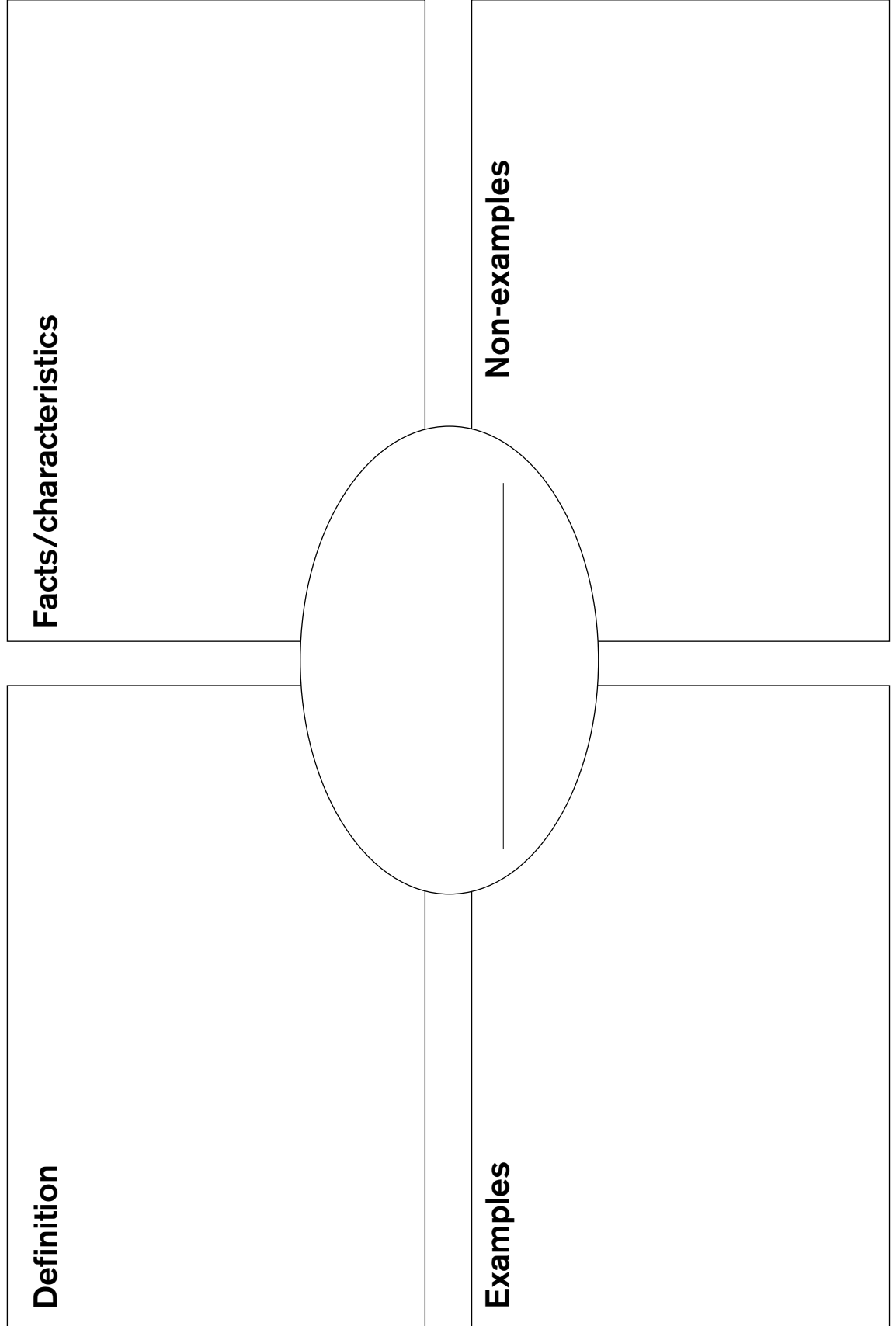
Disappearing Designs

Provide students with coloured paper, water, and a variety of paint brushes (optional). Invite students to use the various brushes, or their fingers, to 'paint' designs on the paper with water. Have them predict what will happen to the water on their coloured paper. Ask:

- **What happened to the water?**
- **Was your prediction correct?**

Concept Diagram

Name: _____



Adapted from Frayer Model Diagram