Lesson 7

Using Water

Learning Standards & Assessment

Time

Resources

Curricular Integration

Handouts

Lesson 7c:
Using Water – Plants

Science

Big Ideas

- Water is essential to all living things, and it cycles through the environment.
- Forces influence the motion of an object.

Content

- Water conservation
- Types of forces

English Language Arts

Big Ideas

- Through listening and speaking, we connect with others and share our world.

Content

- Strategies and processes
  - oral language strategies

45-60 minutes, over at least 2 days

Educator's Kits, including hardcopy lesson plans and support materials, are available for loan through the CRD. For pickup locations, print-friendly materials and multimedia tools see **www.crd.bc.ca/teacher** or contact the CRD at 250.360.3133.

Purpose

This is the third of the Using Water lessons. This lesson provides hands-on opportunities for students to explore how plants use fresh water.

Preparation

1. Photocopy (one/student) "How Plants Use Fresh Water". This lesson extends over two days.
2. Prepare the following materials for the experiments:
   - select a houseplant (or one plant/group, if available), and leave it un-watered for as long as it takes to look droopy and dry
   - "wilt" several stalks of celery (two per group) by leaving them in a warm dry place for one or two days.

Procedure

Ask students to predict: "What would happen if a plant did not get enough water?" (Answer: It would wilt, would not be able to transport nutrients throughout the plant and could eventually die.)

DAY ONE

Houseplant Experiment

1. Show students the wilted houseplant, or assign each group a houseplant.
2. What can they observe about this plant? Have them record their observations on the student activity sheet, "How Plants Use Fresh Water."
3. Water the plant(s). Explain that you will observe the plant again the next day.

Celery Experiment

1. Distribute one stalk of wilted celery to each group.

Teacher Resources

- Assessment Tool: "How Plants Use Fresh Water" performance grid template

Student Resources

- Handout: "How Plants Use Fresh Water"
- Assessment Tool: "How Plants Use Fresh Water" performance grid template
- Water Portfolio

Lesson Resources

- Images of plants using water **www.crd.bc.ca/teacher**
- House plant, slightly wilted (1/class or 1/group)
- Celery sticks (2 /group)
- Food colouring (for best effect use a bright colour).
- Clear cups (1/group)
- tap water

2. What can they observe? What do they think will happen if they put the celery in a glass of water? Have them discuss their predictions in their groups, and record their predictions on the student activity sheet.
3. Distribute a cup of water to each group.
4. Have students place the celery stick into the cup and record what happens.
5. Distribute the second piece of celery to each group.
6. Have students predict what will happen when they place the celery in a glass of coloured water.
7. Add food colouring to each cup of water.
8. Have students record the results on their handouts.

Discussion

Debrief as a class, using questions such as the following:

- What happened to the first stalk of celery? Why do you think that happened? *Water gives a plant structure.*
- What happened to the second stalk of celery? *Coloured water moves up into the stalk.*
- Were your predictions correct?
- Based on these observations, what do you think will happen to the houseplant tomorrow?

DAY TWO

Houseplant Experiment

1. In their groups, have students observe and record what happened to the plant.

Discussion

Debrief as a class, using questions such as the following:

- What happened to the houseplant? Why?

  When a wilted plant is given water, it will stand up straight again. Water gives a plant structure.

- What did you learn from these experiments?

  Plants use water for :

  - » *support - water plumps up the plant, giving it structure.*
  - » *to transport food, minerals and sugars somtimes against gravity (tension)*
  - » *growth and reproduction- fruit, seeds, flowers, roots*
  - » *food. Water is essential in creating sugar to feed the plant (photosynthesis)*
  - » *storing energy - water transports sugars to be stored*
  - » *keeping cool - water vapour evaporates through holes in plant leaves. (transpiration)*

- Do you think we could give the plant too much water? What do you think would happen?

  Yes, too much water is not good for plants. It can:

  » *"drown" the plant, plants need air in the soil to "breathe"*
  » *cause roots to grow shallow in the ground instead of deep into the soil. This means they are dependent on a continuous source of water instead of becoming "independent" and seeking their own source underground.*

Curricular Competencies

Look for evidence that students are able to:

Science

- Questioning and predicting
  - Demonstrate curiosity and a sense of wonder about the world
  - Observe objects and events in familiar context
  - Ask questions about familiar objects and events
  - Make simple predictions about familiar objects and events
- Planning and conducting
  - Make and record observations
  - Safely manipulate materials to test ideas and predictions
  - Make and record simple measurements using informal or non-standard methods
- Processing and Analyzing
  - Sort and classifydata and information using drawings, pictographs and provided tables
  - Compare observations with predictions through discussion
  - Identify simple patterns and connections
- Evaluating
  - Compare observations with those of others
  - Consider some environmental consequences of their actions
- Communicating
  - Communicate observations and ideas using oral or written language, drawing, or role-play

Extensions and Adaptations

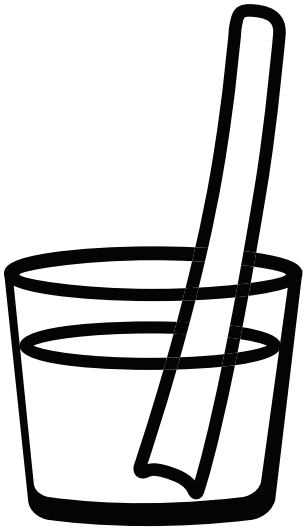
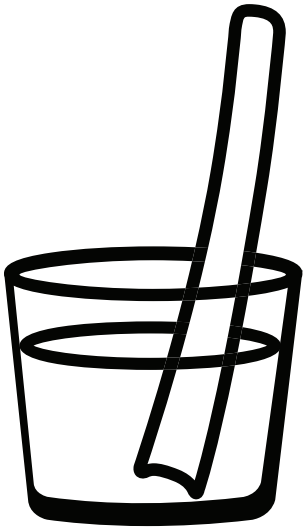
- As an alternative to the gallery walk approach, have students find pictures (from books, magazines, the Internet, etc.) of plants using water, then share them in small groups or as a class.
- Extend the lesson by providing opportunities for students to learn more about some of the plants they have seen, as well as plants that have adapted to living in habitats with very little water (e.g., cactus).
- **Compare and contrast.** Compare a fresh cut flower to a houseplant over time. Which lives longer and why? *Answer: Houseplant. Plants also need nutrients from soil to survive.*
- **Compost Workshop**- Book a class program with the Greater Victoria Compost Education Centre. Students learn the importance of composting for reducing waste and improving our soil, water and air. **https://www.compost.bc.ca/education/school-programs/**
- **CRD Parks Workshop**. Register your class for a CRD Parks Nature Program **https://www.crd.bc.ca/education/school-programs/for-k12-teachers/field-trips**
- **The Eco Learning Hive.** A list of local southern Vancouver Island organizations offering environmental fieldtrips and programs **ecolearninghive.org/**
- Recreate the game from lesson 7b, but this time focus on drought tolerant, native plants **https://www.crd.bc.ca/education/natural-gardening**

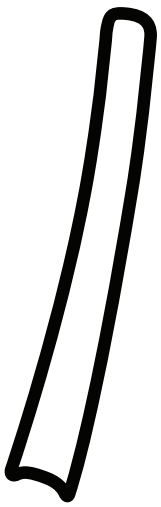
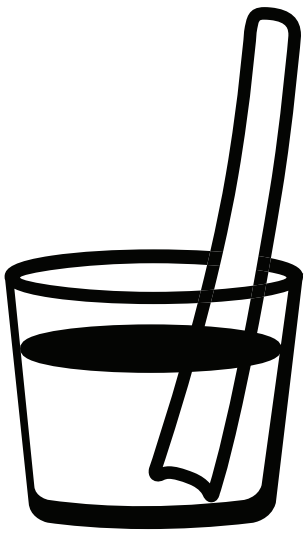
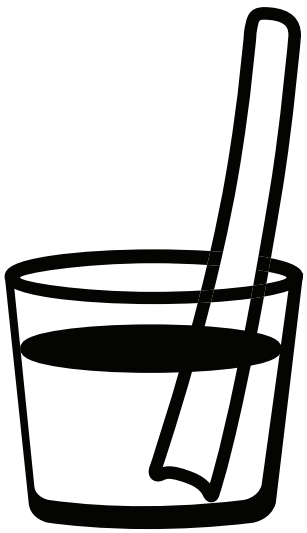
How Plants Use Fresh Water

Name: _____ Date: _____

Draw what happened!

PLANT		
		
BEFORE: What does the plant look like?	I PREDICT: What do you think will happen if the plant is watered?	AFTER: Draw what happened.

STALK OF CELERY IN WATER		
		
BEFORE: What does the first stalk of celery look like?	I PREDICT: What do you think will happen if you put the celery in a glass of water?	AFTER: Draw what happened.

STALK OF CELERY IN COLOURED WATER		
		
BEFORE: What does the second stalk of celery look like ?	I PREDICT: What do you think will happen if you put the celery in a glass of coloured water?	AFTER: Draw what happened.

Based on what you saw:

1. How do plants use water?

2. Do plants need water to survive? What clues did you see?

3. Which do you think will live longer, the houseplant or the celery? Why?