
Grade 2 Learning Experiences: Earth and Space Systems: Air and Water in the Environment





Experience 1: Where Does Water Go?

[Long Range Plan - Grade 2 - Model 2](#)

This series of learning experiences will introduce students to the concept that nature works in cycles (specifically the water cycle; with opportunities to connect to other science curriculum strands and learning from previous grades). Students will engage in a provocation to get them wondering about what happens to water as it evaporates, create their own water cycle in a bag experiment where they can observe the changes of state that water goes through as it moves through the water cycle, and create a model of those changes using coding. A variety of extensions and cross-curricular opportunities will allow teachers to customize these experiences to suit their students' needs and learning styles while allowing for authentic assessment for, as, and of learning.

In the real world, scientists and engineers need to record their thinking and keep records of their scientific processes and engineering designs for a number of reasons. In these experiences, students will be using a science journal as a way of tracking their scientific thinking as they emulate scientists and engineers while engaging in the learning to make predictions, record processes, and observations, and draw conclusions about scientific phenomena. The journal will also be used during STEM investigations as a place for solving solutions to real-world problems (brainstorming, describing plans, and drawing designs for prototypes) and will be an evidence-based source of assessment information.

Overview of learning experiences – why these activities	<p>In this learning experience students will create curiosity and wonder about the natural world around them by engaging in an Inquiry/Student-centered approach to exploring how water travels through the water cycle. Students will engage in an exploration of the big idea “Where does water go?” and then generate further questions to drive their learning about the processes of evaporation, condensation, precipitation, and collection.</p> <p>These learning experiences link to the Grade 2 Long Range Plan Model 2, found in March/April.</p>
Prior Knowledge / Prior Skill Set(s)	<p>Teachers may wish to use or introduce a science journal for students to record their questions, observations and to communicate their learning. If this is the first activity that your students will be using a science journal, consider a modelled or shared approach to</p>

	<p>completing the journal until you feel your students are able to complete a journal activity on their own. The journal can then be used as a form of assessment throughout the lesson series. You may use your own idea of a journal or use a Science Journal (see Appendix A: Science Journal).</p> <p>Students should be familiar with the terms liquid, solid, and gas prior to the investigation. Consider a vocabulary bulletin board or worksheet for students to refer to throughout the lesson series.</p>
<p>Strand A - STEM Investigation and Communication Skills</p>	<p> A1.1 Scientific Research -use a scientific research process and associated skills to conduct investigations</p> <p>   A1.5 Communication -communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes</p>
<p>Overview / Big Ideas/Fundamental Concepts</p>	<p>The water cycle involves the continuous movement of water in different phases (evaporation, condensation, precipitation, and collection). In this learning experience, students will be introduced to the concept that water is all around us in the different states of matter. They will drive an inquiry using the big question “Where does water go?” leading them to discover the different stages of the water cycle.</p>
<p>Learning Goals / Success Criteria</p>	<p>By the end of this learning experience, students will:</p> <ul style="list-style-type: none"> ● Use a journal to record ideas, observations and to communicate ideas associated with inquiry and investigation ● Discover, through investigation, the different stages of the water cycle ● Identify the three states of water as it moves through the water cycle ● Make connections between their own experiences and new learning ● identify conditions that cause a change in the state of water <p>Educators are encouraged to co-create success criteria with students and share “I Can Statements” based on the curricular expectations. Sharing options can include:</p>

have students work in pairs or small groups to save time and reduce materials)

5. Gather the students outside in a space away from where they were creating the water art. Initiate a discussion about the properties of water (or read a book about water).
6. After the discussion, explain that you will tour the art one more time before going inside. By now some or all of the water art should have evaporated, ask students "Where did the art go?"
7. Have students write in their science journal to answer the question (conduct as a modelled or shared activity if students have not used a science journal before). Students can use pictures to show the before and after of their art.

Alternate activity for indoors - provide each student with an ice cube and a piece of paper. Students complete the activity by drawing on construction paper with the ice. Continue the activity from step 5.

What the Students Do:

Initiating and planning

- Identify and plan ideas for the art they would like to create with liquid water

Performing and Recording

- Construct art using liquid water
- Participate in a gallery walk
- Students can draw pictures to show the before and after of their art.

Analysing and Interpreting

- Make observations and draw conclusions about what happened to their art in the hot sun.
- Ask questions related to the initial big idea of "Where does water go?"

Communicating

- Share their observations, conclusions, and further wonderings in their science journal

Consolidation (10-20 min.)

	<ol style="list-style-type: none"> 1. After writing in their journal, have students share some of their answers to the question “Where does water go?” Guide students in a discussion that the water evaporated to become water vapour. 2. Explain the term evaporated (see Science and Technology Vocabulary) and add the term to the vocabulary sheet or wall for future reference. 3. Be sure that students understand the heat of the sun helps the water to change from liquid to gas. Ask “Where does the water go after it evaporates? Is it gone forever?” 4. Lead students to identify that water is recycled using a process called the water cycle and that evaporation is one stage in that cycle. Ask “What do you think happens to the water once it evaporates? How does it come back down?” 5. Lead students to understand that as the water cools it turns back into liquid water (condensation) then falls back to the Earth as precipitation (snow, rain, hail) and collects in rivers, lakes, and oceans. 6. Use the diagram (see Appendix B: Water Cycle Diagram) and have students label the stages of the water cycle. 7. Have students record any new questions or understandings on a sticky note and stick it to a chart paper titled “Where does water go?” Refer to the paper through the lesson series to answer or address questions.
<p>Science and Technology Expectations</p>	<p>Earth and Space Systems: Air and Water in the Environment</p> <p>Overall Expectations</p> <p>E2: demonstrate an understanding of the properties of air and water, including water in various states, and of ways in which living things depend on air and water for their survival</p> <p>Specific Expectations</p> <p>E2.1 demonstrate an understanding of the key properties of air and water</p> <p>E2.2 identify sources of water in the natural and built environments</p> <p>E2.3 describe the stages of the water cycle, including evaporation, condensation, precipitation, and collection</p> <p>E2.4 identify the three states of water in the environment, and describe how temperature changes affect the state of water within the water cycle</p> <p>Matter and Energy: Properties of Liquids and Solids</p>

	<p>Overall Expectations</p> <p>C2: demonstrate an understanding of the properties and physical changes of liquids and solids</p> <p>Specific Expectations</p> <p>C2.2 describe the properties of liquids and solids</p> <p>C2.3 describe properties of liquid water and solid water, and identify the conditions that cause changes from one state to the other</p>
<p>Science and Technology Vocabulary</p>	<p>Evaporation: This is when heat energy from the sun causes water from bodies of water to rise into the air and turn into water vapour (gas).</p> <p>Condensation: This is when water vapour in the air cools down and turns back into liquid water.</p> <p>Precipitation: This is when water (in the form of rain, snow, hail, or sleet) falls from clouds in the sky.</p> <p>Collection: This is when water that falls from the clouds as rain, snow, hail, or sleet, collects in the oceans, rivers, lakes, and streams.</p> <p>Solid: matter with a definite shape and volume. Particles are densely packed.</p> <p>Liquid: matter with a definite volume but takes the shape of the container it is in. Particles have more space between them allowing the matter to flow and pour.</p> <p>Gas: matter with no definite shape or volume. Particles are widely spaced so that they will fill any space that it is in.</p> <p>Cycle: a series of events that repeat in a pattern with regularity such as seasons, or life cycles</p>
<p>Equipment and Materials</p>	<ul style="list-style-type: none"> ● Journal pages or journal notebook (see Appendix A: Science Journal) ● Small spray bottles and sponges ● Water in pans or pails for students to use ● Vocabulary wall or chart paper (create as you introduce new vocabulary) ● Water cycle diagram activity guide (see Appendix B: Water Cycle Diagram) ● Read aloud about water <ul style="list-style-type: none"> English Suggestions: A Drop of Water By Walter Wick Hey, Water! By Antoinette Portis
<p>Timeline and Preparation</p>	<p>Lesson Preparation should take approximately 20 - 30 min.</p>

	<p>Prior to the lesson, you will need to gather the materials required for the water art.</p> <p>Have the journal pages (if chosen) and water cycle diagram photocopied prior to the lesson.</p> <p>You may wish to have your vocabulary sheet or wall pre-populated with the vocabulary for this lesson as you will refer to it again in the next learning experience.</p> <p>You may also wish to prepare any chart paper anchor charts ahead of time.</p> <p>For the next lesson you will need to gather materials for the experiment (blue food colouring, sandwich bags, small plastic cups, permanent markers)</p> <p>Lesson Timeline:</p> <p>Minds On 10 min. Action 30 min. Consolidation 10-20 min.</p> <p>This activity can be extended based on student engagement/interest/driving questions/inquiry</p>
Safety Considerations	<p>Consider setting clear boundaries for where students can create their art. Remind students to use the water for the art only.</p> <p>Refer to these safety resources:</p> <ul style="list-style-type: none"> ● Safety in Elementary Science and Technology (STAO) ● Safe Activity Foundations in Education Document (SAFEdoc) ● Science and Technology, Grades 1-8 (OCTE) ● Ontario Curriculum Program Planning – Health and Safety
Opportunities For Assessment	<p>This provocation activity is designed to get students thinking about the natural world around them and connect to their own experiences.</p> <p>Assessment FOR Learning: During the water art activity, observe students' answers to the big idea questions. From the class discussions, you can assess students' understanding of the concept</p>

	<p>of water in different forms. Use the checklist (see Appendix C: Success Criteria Checklist) to record your observations and evaluate what students already know and which direction the learning will take after this initial inquiry.</p> <p>Assessment OF Learning: The student’s journal pages can be used as an example of student thinking and understanding.</p> <p>The completed and labeled water cycle diagram can be an assessment of learning. Students should be able to accurately label the correct terms beside the correct process.</p>
<p>Instructional Strategies and Adaptability</p>	<p>This learning experience makes use of a variety of instructional strategies. You may wish to adapt or change the strategy as indicated in the instructions section of this document.</p> <p>You may wish to scribe ideas or journal for students who require extra support.</p> <p>Some students may benefit from having the vocabulary and definitions on a handout sheet as well as being able to see and refer to them on a bulletin board.</p>
<p>Additional Supporting Resources</p>	
<p>Cross-Curricular Opportunities</p>	<p>Language:</p> <p>Oral Communication:</p> <ul style="list-style-type: none"> ● listen in order to understand and respond appropriately in a variety of situations for a variety of purposes ● use speaking skills and strategies appropriately to communicate with different audiences for a variety of purposes <p>Writing:</p> <ul style="list-style-type: none"> ● generate, gather, and organize ideas and information to write for an intended purpose and audience <p>Drama</p> <ul style="list-style-type: none"> ● acting out the water cycle or the impact of water in different environments

	<ul style="list-style-type: none"> • apply the creative process to dramatic play and process drama, using the elements and conventions of drama to communicate feelings, ideas, and stories
Future Opportunities / Next Steps	<p>To get them thinking globally you might also consider posing the question How does the water cycle affect the weather on Earth? How is the water cycle affected by the changing weather on Earth (ie. climate change)?</p> <p>The next lesson in the series will allow students to see, through experimentation, how the water cycle works. They will be using observation skills to identify how water moves through each stage of the water cycle and what different states of matter water can take as it moves through the cycle.</p> <p>Continue to allow students to make connections to their own experiences and ask questions to further their inquiry using the science journal.</p>

Appendix A – Science Journal

Science Journal

Name:

Date:

Draw a picture of the water art you created.

Draw a picture of what your water art looked like during the second gallery walk.

What happened to your art? Where do you think the water went? (use words or pictures or both!)

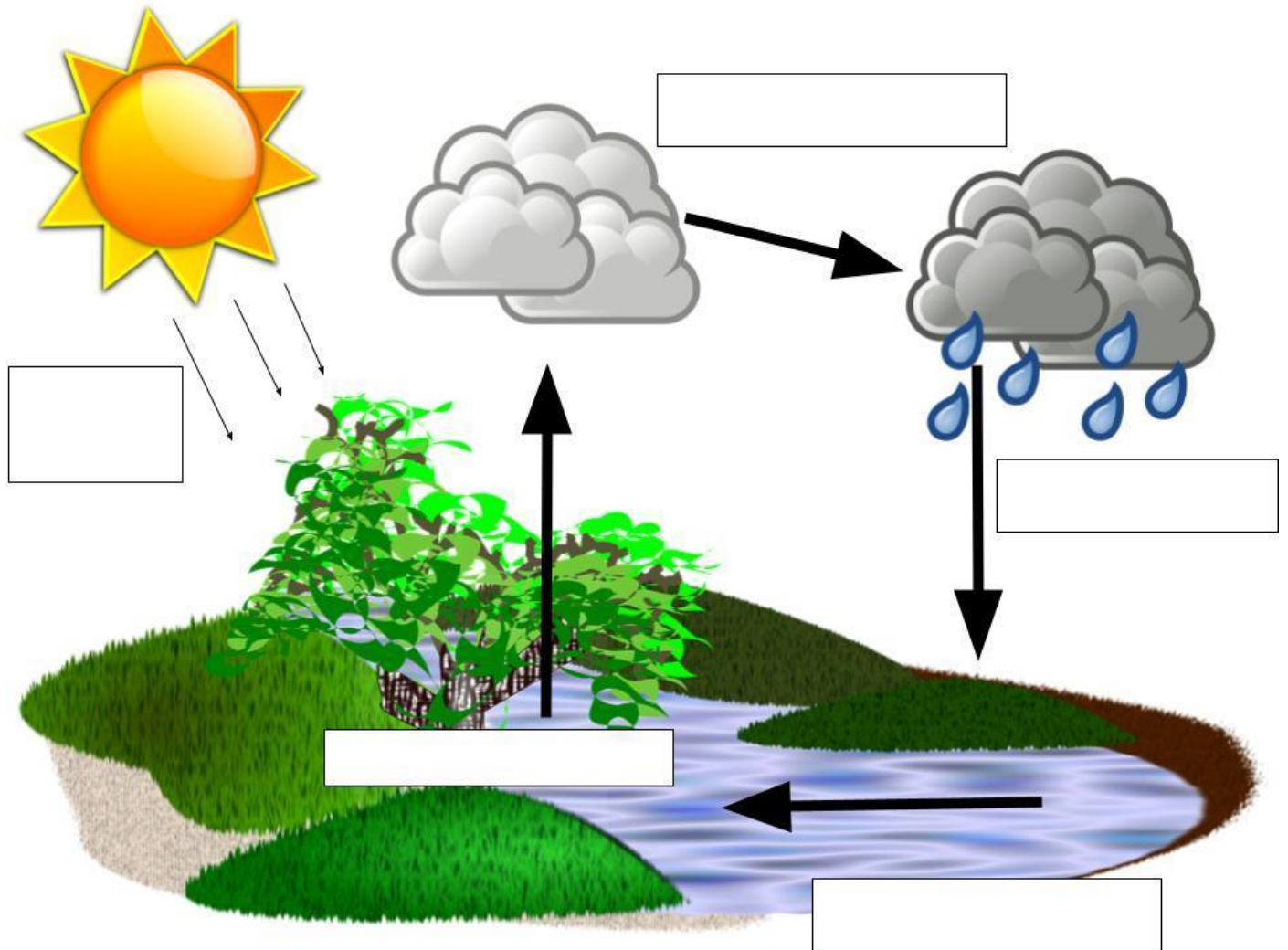
Write 1 more question about water that you want to know the answer to.

Appendix B – Water Cycle Diagram

Water Cycle Diagram

Name: _____

Date: _____



Word Bank

heat from the sun

condensation

evaporation

precipitation

collection

Appendix C: Success Criteria Checklist

Success Criteria Checklist

Name:

Date:

I can	Met	Not Yet	Observations
I can ask “thick” questions about how water moves through the water cycle.			
I can write or draw my ideas to show my thinking.			
I can explain how water moves in a cycle.			
I can label the stages of the water cycle using science vocabulary.			

Name:

Date:

I can	Met	Not Yet	Observations
I can ask “thick” questions about how water moves through the water cycle.			
I can write or draw my ideas to show my thinking.			
I can explain how water moves in a cycle.			
I can label the stages of the water cycle using science vocabulary.			