



Water Conservation

Grade Level	3 rd	Subject	Water Cycle
Objective(s): The students will investigate a way to conserve our water supply.		SOL Addressed: 3.9 The student will investigate and understand the water cycle and its relationship to life on Earth. Key concepts include a) there are many sources of water on Earth; b) the energy from the sun drives the water cycle; c) the water cycle involves several processes; d) water is essential for living things; and e) water on Earth is limited and needs to be conserved	
		Common Core Standards: 5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. [Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.] Students who demonstrate understanding can: 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	

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<p>Materials Needed Per Class of 25</p> <p style="text-align: center;">and</p> <p>Prior Knowledge</p>	<ul style="list-style-type: none"> • Large piece of chart paper (1 piece for every four students) to list water conservation ideas • Markers, pencils, crayons • Premium Student and School Awareness Water Conservation Kit • Gallon and sandwich size plastic bags • Masking and Duct Tape • Popsicle sticks • Pipe Cleaners • Rulers • Cups <p>This activity will be completed at the end of the unit. The students should be able to brainstorm different ideas of how they can conserve water in our classroom that can also be used at home.</p>	
<p>Ways to differentiate this lesson plan</p>	<ul style="list-style-type: none"> • EXTENSION for Higher Level Learner Have students research their project ideas to see if it has already been done and how they can improve their ideas • MODIFICATIONS The teacher can guide students that will not be able to do this activity at home with ideas they can do at school and still get the same experience. 	
<p>Introduction/ Anticipatory Set</p>	<p>Anticipatory Set: Give students different scenarios and have them vote with a thumbs up (yes) and a thumbs down (no) if they are water conservation techniques.</p> <p>Questions to ask students:</p> <ul style="list-style-type: none"> • Why is the scenario not showing water conservation? • What can you do to change this scenario so that it is conserving water? 	<p>Introduction: The class will get into groups of 4 with the large chart paper and markers, crayons, and pencils to brainstorm and write down ideas they can do at school and at home to conserve our water supply.</p>
<p>Guided Practice</p>	<p>The groups will present their ideas for water conservation at home and school.</p> <p>The teacher will display ideas around the room.</p> <p>Sample Facilitator Questions for the Activity:</p> <ul style="list-style-type: none"> - How did you decide that water conservation idea would work both at school and at home? - Would that idea hold up over time (like a month)? - What facts from your project idea could you collect? - Are there other ways to create this project idea with less materials? 	

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Independent Practice	<p>Working in their groups of 4, students will construct their water conservation idea.</p> <p>Working in these small groups, students will be responsible for deciding which materials they should use, if the materials will last over time, and what area of our classroom and their home they could use their idea.</p> <p>Each group will work independently to create their water conservation project.</p> <p>Groups will then rotate and gather ideas on how they can help their classmates improve their projects.</p>
Closure (Summary of Lesson)	<p>The teams of 4 will present their project and tell the class how it works and what information they hope the project will give them.</p>
CEED Building Application/ Sensor Data	<p>The student will review the CEED website to gain ideas on how to conserve water.</p>
Assessment	<p>The student will receive a Premium Student and School Water Conservation Kit to use at home. They will report back within a week of how they are using their kits at home, what changes they have noticed with water conservation in their homes, and what information they have gathered from their water conservation kits.</p>

INQUIRY LEARNING RESEARCH PROCESS GUIDELINES

The following table is just one guideline to use for developing your own inquiry materials. The seven steps in the Learning Research Process include not only how people learn but also how research is conducted. The heart of the design, the three-stage learning cycle of exploration, concept invention or formation, and application is embedded in the middle. In addition to these three stages, this design takes into account that learners need to be motivated to spend the time required for understanding complex subjects and that learners need to build this new knowledge onto prior knowledge. These are similar to the 5E and 7E learning models.

The Learning-Research Process

Steps in the Learning-Research Process	7E Equivalent	Component of the Activity
1. Identify a need to learn.	Engage	An issue that excites and interests is presented. An answer to the question <i>Why?</i> is given. Learning objectives and success criteria are defined.
2. Connect to prior understandings.	Elicit	A question or issue is raised, and student explanations or predictions are sought. Prerequisite material and understanding is identified.
3. Explore	Explore	A model or task is provided, and resource material is identified. Students explore the model or task in response to critical-thinking questions.
4. Concept invention, introduction, and formation	Explain	Critical-thinking questions lead to the identification of concepts, and understanding is developed.
5. Practice applying knowledge.		Skill exercises involved straightforward application of the knowledge.
6. Apply knowledge in new contexts.	Elaborate and Extend	Problems and extended problems require synthesis and transference of concepts.
7. Reflect on the process	Evaluate	Problem solutions and answers to questions are validated and integrated with concepts. Learning and performance are assess

Hanson, D. (2006). POGIL Instructor’s Guide to Process-Oriented Guided-Inquiry Learning. Lisle, IL: Pacific Crest