

Water Use & Conservation Technologies	Grade 2 Science - Air and Water in the Environment
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# Lesson Plan

**Description**  
 In this lesson, students will explore the concept of responsible water usage by assessing their personal and household water usage patterns. They will then design, code, and create a water use timer using BBC micro:bit devices to promote water conservation. Students will apply computational thinking strategies to solve a real-world problem and use coding skills to program their micro:bits.

<p><b>Learning Outcomes</b></p> <p>By the end of the lesson, students should be able to:</p> <ul style="list-style-type: none"> <li>● Assess their personal and household water usage habits.</li> <li>● Identify areas where water conservation can be practised.</li> <li>● Design a water-use timer concept.</li> <li>● Code the micro:bit to function as a water-use timer.</li> <li>● Reflect on the importance of responsible water usage.</li> </ul>	<p><b>Specific Expectations</b></p> <p>A2. Coding and Emerging Technologies: use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life</p> <p>A2.1 write and execute code in investigations and when modelling concepts, with a focus on decomposing problems into smaller steps</p> <p>E1. Relating Science and Technology to Our Changing World: assess ways in which the actions of humans have an impact on the quality of air and water, and create plans to protect these resources</p> <p>E1.2 assess their personal and household uses of water, and create a plan to use water responsibly</p>
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**Introduction**  
 After watching the video “Water Saving Tips and Tricks - Let's Save the Planet - The Environment for Kids” as a provocation for the topic of water use students will discuss ways they use water in their daily life, why it is important to take care of water, and how to reduce their usage. Next, they will watch a video to learn what a microbit is with optional tutorials for beginners. In addition, they will learn about computational thinking strategies, “Inputs and Outputs” as well as the variety of components of micro:bits.

<p><b>Action</b></p> <p>Students will then take their water-saving goals and foundation micro:bit knowledge and apply it to building a water-use timer and conservation device. Following the steps outlined in the slides students will first code a micro:bit to show an “umbrella” icon and a string of the word “timer” to get themselves acquainted with downloading code to a micro:bit successfully. Then students will copy a basic code that will create a 5-second timer that tells the user when to “go” and “stop” their water use. For students who would like an additional challenge (and if they have V2 micro:bits) they can then build a water timer with an alarm function. Students can play around with the sounds and make it their own. Students are encouraged to go through the debugging process and reflect on what good code looks like and all of the problem-solving strategies needed to make a functional system.</p>	
<p><b>Consolidation/Extension</b></p> <p>Students will be prompted to reflect upon the activity including the value of water conservation, other ways to reduce water, and the challenges of building and coding micro:bit systems. They will also be given the challenge of inventing any device (not just using micro:bits) that could potentially solve this problem.</p> <p>In addition to a water timer, students can try out an advanced automated watering system that can be used for plants, showers, and so much more.</p>	
<p><b>Accommodations/Modifications</b></p> <p>Although it is ideal to have one micro:bit to every 1-3 students, sometimes the technology is unavailable. Students can try building their system and using the emulator within MakeCode to see if it works. Tinkercad also has a virtual micro:bit option, although it is quite advanced.</p>	<p><b>Assessment</b></p> <p>Often with projects such as these, anecdotal assessment is always the most rich. Seeing students and their “EUREKA!” moments and working through various challenges at their own level is incredible. There will also be a rubric provided to quantify their work.</p>
<p><b>Additional Resources</b></p> <p>Additional resources through the BBC Micro:bit website and Black Gold School District micro:bit page are also available to explore.</p>	