



**Thirst for
Knowledge:
Building a
Watershed**

MOUNT HOLYOKE

Title	Thirst for Knowledge: Building a Watershed
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Subject Areas	Earth Science Geography ELA Art
Grade Level	2nd grade - (2) 40-45-minute lessons, or (1) 80-90-minute lesson.

Content Curriculum Frameworks addressed in this lesson	<p>Science Standards (Grade 2) 2-ESS2-2. (Earth Science) Map the shapes and types of landforms and bodies of water in an area.</p> <p>History and Geography Standards (Grade 1 and 2) 4. Describe a map as a representation of a space, such as the classroom, the school, the neighborhood, town, city, state, country, or world.</p> <p>Visual Art Standards (K-4) 1.2 Create artwork in a variety of two-dimensional (2D) and three-dimensional (3D) media (for example: 2D – drawing, painting, collage, printmaking, weaving; 3D – plastic (malleable) materials such as clay and paper, wood, or found objects for assemblage and construction).</p> <p>ELA Standards Writing (Grade 2) MA 8. Recall information from experiences or gather information from provided sources to answer a question.</p> <p>ELA Standards Speaking (Grade 2) MA 1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.</p>
Specific Technology Standards addressed in this lesson	<p>ISTE standards for teachers</p> <ol style="list-style-type: none"> 1. Facilitate and Inspire student creativity <ol style="list-style-type: none"> a. Promote, support and model creative and innovative thinking and inventiveness (visual support and introduction to watershed concepts via YouTube video and google slides)

Learning Targets and Assessments	
<ul style="list-style-type: none"> I can explain what a watershed is and how it works. I can work together with my classmates to build a structure, make a prediction and test an idea. I can use geography words (hill, valley, etc.) to describe parts of a watershed. I can show what different things on a map mean using a key. 	<p>Assessments FOR Learning (formative)</p> <ul style="list-style-type: none"> Teacher will call on students during the lesson on watershed to check for understanding Students will work collectively to construct a model watershed in order to understand function of watershed Students will work in small groups Students will share ideas in a large group <p>Assessments OF Learning (summative)</p> <ul style="list-style-type: none"> Completed note-catcher examining the purpose of watersheds and how the watershed works

INTRODUCTION of the lesson: Building engagement/setting purpose/activating prior knowledge....	
Instructional Steps	Differentiation
<p><u>Background knowledge: assumption is that students will already have received a lesson on the Quabbin Reservoir and have some background knowledge of basic landforms and how to read a map. We recommend following up this lesson with a lesson on the water cycle to round out student knowledge about Earth’s water systems.</u></p> <p>Hook (10 min): Students will watch a one minute Youtube video: “What is a watershed?” (link on PowerPoint)</p> <ul style="list-style-type: none"> Ask students what a watershed is. Hold up tree branch, ask students where they think water would go if a raindrop landed on the tip of the twig. Do a demonstration; show that water travels down the smaller twigs to the larger branch Show images of tree branch and water drainage patterns to get students to start thinking about the pathways water takes 	<ul style="list-style-type: none"> Incorporates visual and auditory learning

Scaffolding plans for the BODY of the instruction	
Instructional Steps	Differentiation
<p>Vocabulary list (10 min): Teacher will go over specific vocabulary with students</p> <ul style="list-style-type: none"> This can be done any way that the teacher would like, including: <ul style="list-style-type: none"> using visuals (anchor charts, models) call-and-response (teacher says word and definition and students repeat) signs (teacher or students come up with hand gestures to represent vocab words, or use ASL) 	<ul style="list-style-type: none"> Potential for visual, auditory, and kinesthetic learning

- Movement and dance moves
- And/or any combination of these

Build a watershed (10 min) (Supplies on each table: bag of rocks, Tupperware of blue water with sponge, tray, plastic wrap)

- Now working as a small (table) group, students place rocks on tray. Next cover rock with plastic wrap
 - Teacher prompts their think about constructing their model by asking them which landforms they want to build
 - Teachers will instruct students to make one side higher in elevation.
 - Teachers will circulate among groups to observe and answer questions.

Gallery Walk (10 min)

- Teacher will call on a few students to describe their group's watershed structures.
- After a few students share, teacher will ask if students noticed their classmates using any geography words (hill, valley, mountain, etc.)
- Teacher will then ask students to move around the room to view other group's watersheds.
 - Students should talk with their group members about their classmates' structures using descriptive terms.
 - They should also talk about ways that the other groups' structures are similar and different to theirs.
- Students return to their own table for the next activity.

Draw a map and make predictions (20 min)

- Teacher demonstrates how to draw a simple bird's-eye view map.
- Can review vocab, in particular discuss map keys.
- Students each draw a map of their rock landscape on their note-catchers (see handout).
- Working in their small groups, students discuss, and make predictions, of where rain will flow and collect.
- Individually sketch their predictions on their maps

Bring on the rain! (10 min)

- When directed, students will drizzle landscape with the blue water provided.
- They will then observe where the water goes and answer questions on note catcher (seen below)
- Students will sketch the water and its pathways on their earlier map (in a new color).
 - Teachers will circulate to ensure that materials are being used properly, answer questions, clarify directions, and observe student discussion.

- Incorporates kinesthetic and collaborative learning
- Students can be assigned/self-assign different jobs within the group during the building, drawing and experimentation stages, if the teacher chooses (norms for these jobs should be pre-taught and practiced beforehand)

<p>Small group discussion (10 min)</p> <ul style="list-style-type: none"> ● Students will reflect on their findings in a group using the following questions as prompts (students can write or draw their answers): <ul style="list-style-type: none"> ○ Where did the water end up? ○ Did water from the high rocks travel all the way to the low rocks? If not, what happened? ○ Imagine what your town looks like (does it have hills? valleys?) Do you think water takes the same path in your town as it does in your rock watershed? ○ <u>Optional Questions</u>: <ul style="list-style-type: none"> ■ Imagine if a farm or town was built on your watershed. How might that change how the water moves? ■ What else might buildings or things that people do (drive cars, raise animals like cows, etc.) change about your watershed? ● Teachers will circulate to observe student discussion. 	<ul style="list-style-type: none"> ● questions can be differentiated (only do a few, or do all) depending on time and student ability ● more challenging questions for students who may need a bigger challenge
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END Synthesis: How will students synthesize their understanding?	
Instructional Steps	Differentiation
<ul style="list-style-type: none"> ● Debrief Circle: Whole Group Discussion (10 min) <ul style="list-style-type: none"> ○ Students will be asked to share out their discoveries from their small group discussions. They will then be prompted with questions for further discussion, such as: <ul style="list-style-type: none"> ■ Think about the landforms we built today and how the water flowed through them. What was the same about each one? What was different? ■ The Quabbin Reservoir is part of our local watershed. How does the land around the Quabbin seem similar to what we've built today? ■ Why do you think it is important that people can't build on or use the land around the Quabbin Reservoir? 	<ul style="list-style-type: none"> ● Collaborative learning

<p>Materials Required for this lesson (complete list and each document or item typed up)</p> <ul style="list-style-type: none"> -Sponges (1 per table) -Trays (1 per table) -Bags of Rocks (1 per table) -Food coloring -Tupperware (1 per table) -Plastic wrap (few feet per table) -Colored pencils or crayons (2 per child) -Note catchers (1per table)

- small tree branch/ large twig
- A way to project a video clip
- Video Clip: 1 min 18 secs [What Is A Watershed?](#) (2013). What Is A Watershed? - YouTube. Retrieved August 22, 2016, from <https://www.youtube.com/watch?v=QOrVotzBNto>.

Additional resources for more in-depth study.

Project Wet website <http://www.projectwet.org/>

Project WET: Curriculum and activity guide 2.0. (2011). Bozeman, MT: Project WET Foundation.

Social Justice Orientation

A crucial component of social justice is environmental justice. It is critical that we ensure a healthy and vibrant environment for all persons and future generations. Teaching ecological awareness is key to promoting environmental justice. Students will learn how water flow connects separated areas and begin to understand how environmental impacts have large reaching effects. Learning about watersheds is a great entry point for connecting students to their local environment. With following up activities there are many ways to get students active in their community.

Human Development – Age appropriate learning and activities – elaborate on how you selected the activities and how you know they are age appropriate.

It was important to us to ensure that our younger students had the opportunity to use many different modalities to learn and to show their learning. We incorporated visual information through our video, kinesthetic learning in our construction activity, and time to work both in groups and individually during different segments of the lesson. The activities were intentionally selected to give students a hands-on way of conceptualizing an abstract concept, which is appropriate for younger elementary students who benefit from concrete examples. We made the language of our questions and directions accessible to younger learners while still asking students to access higher-order thinking skills. We also scaffolded activities so that students would lead their own learning, but teachers would still be available for support. Finally, we timed our activities to give students of this age sufficient time to grapple with concepts and work collectively while still completing the assignment.

Technology Integration – write a paragraph on how the technology in this lesson enhanced the learning of the students.

Technology was integrated into this lesson to enhance student learning through adding a concise informational video with colorful visuals about watersheds. This video allows students to physically visualize how watersheds exist around them, and provides *some* terminology to guide the lesson. Google Slides also provides a great way of displaying images and directions.

Social Emotional Learning – write a paragraph about how you have included process or activities that speak to the ‘heart’ rather than simply content – the head!

Students will effectively communicate with their peers to share and agree on ideas (Massachusetts Social and Emotional Learning standard 8) to collaboratively build a watershed (Standard APL 5). They will also “seek help and offer help” from peers when managing group and individual tasks (SEL standard 10). They will model and learn to effectively and collaboratively do group work in a manner consistent with classroom norms.

