

Bird's Eye View

Essential Question: How do people in the community try to manage or solve (river related) water problems?

Introductory Lesson #1: This unit will begin with an interactive digital lesson about The Water Cycle and story Why Does It Rain. Students will take what they have learned from the story and the interactive digital lesson on the SMART BOARD and complete and color a worksheet highlighting the important parts / vocabulary regarding the water cycle.

Lesson #2: In class on chart paper students brainstorm how water moves. Then, students go outside with a blank piece of paper, pencil, colored pencils and a clipboard. They find a "sit spot" on the bank of a small tributary to the White River that runs behind our school. Students sketch the tributary concentrating on the flow of the tributary. Which way is the water moving? What causes the flow to speed up / slow down? Are there things that block the flow / make it change direction? Etc. The students then turn the paper over in put into words what is happening with the flow of water at their "sit spot." Back in the classroom we look / share sketches and compare them to the chart we produced before we went outside. Is there anything we want to change or add to the chart based on our outdoor experience? Assessment takes place with adding / deleting to the chart that was completed before we went outside.

Lesson #3: In our circle with chart paper the term *watershed* is introduced. The students have a chance to turn to a partner to "pair / share" what they think a watershed is. I then define watershed on the chart paper and introduce the students to a large poster (provided by the White River Partnership) that shows the White River Watershed. We discuss the different branches of the White as well as the towns and large area of the watershed. Students are able to connect personally with the river as it runs directly behind our school. When looking at the map students are able to locate perhaps where they live, their road etc. We go back to lesson 2 and discuss the flow of water. The assessment in this lesson is their participation.

Lesson #4: Following lesson #3 students create paper watersheds (see attached paperwork under the student work tab) Students have the opportunity to show their learning on the worksheet where I ask them questions about the paper watershed activity. The question I mainly count on for this understanding is the last question which asks about relating what happened on the paper to what this looks like in the real world.

Lesson #5: The White River Partnership comes into the classroom and we spend a good part of the morning discussing / watching a slide show and asking questions. This discussion / presentation leads us into the piece of human involvement coexisting with the natural world in terms of managing water. Students share when it becomes necessary to manage water. Building roads so people can travel / get to work comes up. We then have the discussion about installing culverts so we are able to create roads. The White River Partnership spends a

good deal of time teaching the students about culverts and flooding. The students learn about bankfull, the math behind choosing a properly sized culvert, the material needed / preferred, the cost and whether or not the culvert is "fish friendly."

Lesson #6: With the White River Partnership, parent volunteers as well as me the students take a trip to a culvert that has been rebuilt since it was destroyed during Hurricane Irene. While at our "site of engagement" on Broad Brook the students take the knowledge they learned from the White River Partnership and apply it in the field. The students have a field sheet that was put together by the White River Partnership with input from teachers at a training we (teachers) attended the previous year. (See sheet attached under the "site of engagement tab.") A more detailed description about this lesson is under the "site of engagement" tab)

Lesson #7: Back in the classroom with the White River Partnership we review our findings at the culvert. The students share their measurements for bankfull, was the culvert properly sized, was it a good investment financially for the town of Royalton, was the culvert "fish friendly" and why all those are important. After the White River Partnership leaves. The students work on an assessment that makes sure they understand bankfull which leads us into our outside assessment as we take the sheet provided again by the White River Partnership (created with teacher input) titled Culvert Conclusions. This assessment allows me to see if the students grasped the concepts of "fish friendly", properly sized, bankfull, cost effective, flood resilient (see attached paperwork for Culvert Conclusions under the assessment tab)

Lesson #8: The students have the opportunity for a week and a half to have a stream table in the classroom. We are fortunate to have the Ottauquechee Natural Resources Conservation District loan us the stream table for stream table study. We complete / adjust the lessons / experiments provided online in the Stream Table Lesson Packet created by Jennifer Guarino, Ecotone Education. Jennifer also works with the White River Partnership as well as the Ottauquechee Natural Resources Conservation District. I attended a stream table workshop as well as other trainings Jennifer has led. With the stream table the students experienced and completed activities / experiments about speed / velocity in regards to water flow, natural and unnatural ways for humans to manage water, riparian buffers, cement walls, large and small rocks etc. Students also had a chance to revisit culverts. They were able to take prior knowledge and apply it to the stream table in regards to culvert size, shape, material, cost, "fish friendly", flood resilient etc. Students created a mock town meeting where each student assumed a different role in the community in terms of installing a culvert. The skits / mock town meetings were presented to the class. The assessment for this part of the unit is titled *Stream Table Assessment* (under the assessment tab.)

Lesson #9: Students have to opportunity to show what they have learned when the *Watershed on Wheels (WOW)* visits our school. Students in grades 3-5 have the opportunity to visit WOW. WOW has a stream table as well as a walk through piece that looks at the animals and their reliance on / part of the watershed.

Lesson #10: Students in grades 3-5 will join the White River Partnership for a tree planting along a branch of the White River in Rochester, Vermont. Rochester is significant as it was cut off from the rest of Vermont during Hurricane Irene. By planting trees the tie back to our

Essential Question: *How do people in our community try and manage or solve river related water problems?* The connection the students will have will be that using riparian buffers (natural material) is more effective when helping to control erosion (students' conclusions after our stream table study) that happen when humans have to interfere / co – exist with nature (in this case the natural flow of water.)