

Topic/Week
1. Watersheds - General
2. Watersheds – Kalihi Watershed
3. What lives near my stream
4. Examining what lives near the stream
5. How does water get into a watershed? – water cycle, weather, climate
6. What does water interact with during the water cycle? (sources of pollution)
7. Water Quality – How we measure it
8. Water quality – Doing (Monitoring?)
9. Water quality – comparing sites - 1
10. Water quality – comparing sites – 2
11. Water quality – in two different watersheds - 1
12. Water quality – in two different watersheds – 2
13. Water quality – in two different watersheds – 3
14. Improving the Kalihi Watershed

Wk	Topic	Location	Activities	Assessment	Standard
1.	Watersheds - General	Classroom	<ol style="list-style-type: none"> 1. Short reading on how watersheds can be formed (use vocabulary words?). 2. Class brainstorms ways that Hawaii's watersheds could have formed (volcanoes, rain, earthquakes) 3. Use clay/mud to build a model watershed, spray bottles to simulate water. Students in teams possibly, with different assigned tasks for the kind of watershed they will build. 	Each student able to build a watershed with ridgeline and stream.	<p>8.1 Slow processes form earth</p> <p>1.1 Testable hypothesis</p>
2.	Watersheds – Kalihi Watershed	Computer lab, classroom, or outside	<p>Depending on what is available:</p> <ol style="list-style-type: none"> 1. Use the internet and examine the Kalihi watershed using Google earth. 2. Use maps (print outs of 3-D maps) 3. Go outside and make observations and draw elements of the watershed (e.g. point to hills, point towards ocean) 4. Highlight the stream as a focus of the watershed 5. Students fill out a worksheet that asks about watershed location, natural and human features. 	Students individually fill out question sheets. Students can make observations and inferences.	<p>8.1 Slow processes</p> <p>1.2 Observation vs. inference</p>
3.	What lives near my stream	Outside	<ol style="list-style-type: none"> 1. Students either go to stream or stand along fence. 2. Students draw different organisms that they see near the stream and note how each organism uses a different niche and how it developed that way. 3. Students take samples of plants and animals (if possible – bugs); over the next week these samples are prepared for use under microscopes. 	Worksheets and drawings identifying plants and animals	5.2 Roles of diff org's in same env't
4.	Examining what lives near the stream	Classroom	<ol style="list-style-type: none"> 4. Students examine what they collected near the stream. 5. Students draw plant versus animal cells from viewing the microscope. 6. Students discuss why some plants and animals are different depending on where they live (demonstrated by plants, e.g. those growing in or near the water will look different from those at the top of the hill) 7. Students answer questions about what plants and animals eat and where that energy goes. <p>Possibly – Students plant some of the plants that grow near the stream and watch them grow over time, perhaps experimenting with different growing conditions.</p>	<p>Students can draw the major feature of plant and animal cells.</p> <p>Students can answer questions about why plants and animals differ depending on where they are located on slope.</p>	<p>4.1 Plant vs. animal cells</p> <p>3.2 Org's behavior determined by env't</p> <p>3.1 Food chain</p>

5.	How does water get into a watershed? – water cycle, weather, climate	Classroom	<ol style="list-style-type: none"> 8. Possible visit by Bishop Museum Educator, OR 9. Create a large picture version of a watershed. 10. Students each draw out a word or phrase that describes some element of the water cycle (rain, evaporation, condensation, diversion, uptake by plants, held in soil) and they draw that word. 11. Students place each of their drawings on the large watershed picture. 	Students are able to make an individual drawing and put that piece into a larger picture	
6.	What does water interact with during the water cycle? (sources of pollution)	Classroom, possibly outside	<ol style="list-style-type: none"> 1. Short reading that is a story about a water droplet – (the “droplet” describes what happens to it as it moves towards the stream, picks up pollution, travels on top of road) 2. Use large watershed drawing from last time. 3. Brainstorm the things in the Kalihi watershed could interact with the water droplet (pollution). 4. Draw these as pictures and post on watershed drawing. 5. Possibly, go outside and point at the different things that can impact water quality 	<p>Students can identify at least one source of pollution.</p> <p>Students can describe the pollution abstractly and can identify its source.</p>	2.1 Technology and env't in Hawaii
7.	Water Quality – How we measure it	Classroom	<ol style="list-style-type: none"> 1. Describes elements of water quality (turbidity, oxygen, nutrients) 2. Demonstrate each test (note how colors change, etc.) 	Worksheet	6.1 Form new substances
8.	Water quality – Doing - Ideally, students can continue monitoring stream health over time	Outside	<ol style="list-style-type: none"> 1. Students go outside and either go to stream or use buckets and perform water quality tests. 2. Each team does one test then explains what happened and what it means to the group. 	Students in team are able to explain how they did the test and what it meant.	<p>1.1 Hypothesis/expt'l</p> <p>1.2 Observation vs. inference</p>
9.	Water quality – comparing sites - 1	Classroom or field trip, if possible	<ol style="list-style-type: none"> 1. Water samples are either provided or taken during a field trip from different sites along the Kalihi Stream (forest, developed area, possibly a middle site) 2. Students conduct water quality tests for each sample. 	Students participate in water quality testing.	1.2 Observation vs. inference

10.	Water quality – comparing sites – 2	Classroom	<ol style="list-style-type: none"> 1. Students compare the results from the two sites and brainstorm possible reasons for differences. 2. Students graph the data (incorporate math skills depending on what current math lessons are) 	Each student can identify one possible reason for the difference.	1.2 Observation vs. inference
11.	Water quality – in two different watersheds – 1 – PREP for field trip	Classroom	<ol style="list-style-type: none"> 1. Use maps and pictures to compare the Kalihi Watershed with the Waimea Valley watershed. 2. Students make a hypothesis about how the water quality will be different in the Waimea Valley. 3. Students devise an experiment to test their hypothesis 	Students can each write a hypothesis and an experiment.	1.1 Hypothesis, exp'tal procedures
12.	Water quality – in two different watersheds – 2	Field trip	<p>Waimea Valley offers a field trip that explores the watershed. Students will then also take water samples and do water quality tests there or back in the classroom.</p> <p>We can examine historical sites and discuss life in the past versus life in the present.</p>	Participation in the field trip – completion of a worksheet during the field trip.	Possibly 5.1 Fossils vs living things.
13.	Water quality – in two different watersheds – 3	Classroom, Computer lab if possible	<ol style="list-style-type: none"> 1. Students analyze the data from the field trip (Excel) 2. Students present something they learned about why the two watersheds are different. 	Each student is able to synthesize information from trip.	1.2 Observation vs. inference 2.1 Env't in Hawaii
14.	Improving the Kalihi Watershed	Classroom	1. Each student will be asked to give a presentation about the water quality in the Kalihi Watershed, where pollution comes from, and present one idea for improving the Kalihi stream environment	Each student can brainstorm one idea to improve watershed	2.1 Tech/Econ/Dem – and describes a plan to improve conditions