**Teacher:** Anne Lapera **Class**: Ecology

**Grade**: 12

**Title**: Water Quality Testing Lesson Plan

**Topic**: Components of the local water supply and their affects on humans

**Standards Addressed**: 4.2.12.A: Examine environmental laws related to land use management and its’ impact on the water quality and flow within a watershed

**Big Ideas Addressed**: “[Sustainable use of natural resources is essential to provide for the needs and wants of all living things now and in the future.](javascript:__doPostBack('ctl00$_PageContent$rptBigIdeas$ctl05$lnkBigIdea',''))” (<http://www.pdesas.org/module/sas/curriculumframework/>)

**Essential Questions**: “How are the needs and wants of all living things (including humans) directly connected to successful management of natural resources?” (<http://www.pdesas.org/module/sas/curriculumframework/>)

**Concepts Addressed**: “Humans can cause changes directly and indirectly to ecosystems over time.” (<http://www.pdesas.org/module/sas/curriculumframework/>)

**Competencies Addressed**: “Describe in detail how sustainability balances the needs of humans and society with the needs of a natural system.” (<http://www.pdesas.org/module/sas/curriculumframework/>)

**Specific Objectives**: To help students of all type of learning styles to understand what factors affect our water supply and the impacts those factors have on living organisms

**Required Materials**: water samples, water quality testing kits, projector, powerpoint, water component hand-out lab sheet, student individual whiteboards

**Activities**:

* Engage- Ask students from water sources we get fresh water. Ask students if they know the specific source where the water for their home comes from. Have the students write down the answers on their white boars then hold them up for myself and the other students to see.
* Explore: the students will then be split into groups to discuss what factors contribute to the water supply and where they come from. Each group will then come to front of the room and present their hypothesis to the class.
* Lecture: a powerpoint presentation will be given to the class to inform them of the process of the water cycle, including how water cycles through the environment and its role in supporting ecosystems
* Explain: The groups will then be given samples of water taken from various local locations including (nearby stream, rain water, tap water, and bottled water). The students will then use the water quality kits provided to test each sample. Then they will record the components found in each sample in a lab packet provided to them. ( Data sheet attached)
* Elaborate: Students will research local pollutants and hazards. They will then use their data collected in lab to create a report in what factors they think contribute to the water supply and how they affect organisms in that watershed area.
* Evaluate: The students will share their research with the class in the form of a presentation (in whichever manner they so choose, i.e. with PowerPoint or posterboard, etc.)

**Assessment Strategies**:

Diagnostic: This will be addressed in the engagement part of the activity. I will be able to gauge the students’ prior knowledge based on their answers to the questions I ask

Formative: The students’ presentations will be accompanied by a short paper which they will turn in. The paper will not be graded but will be returned to the students with my comments to help them adjust their understanding of the material.

Summative: There will be a chapter test given on the water cycle that will be graded. The lab and presentation will help relate the material the students to real world examples and help them to understand how the water cycle works and how humans and other factors impact it.

Water Quality Data Sheet

|  |  |  |  |
| --- | --- | --- | --- |
| Tap Water | Stream Water | Rain Water | Bottled Water |
| nitrogen |  |  |  |
| phosphorus |  |  |  |
| PH |  |  |  |
| Alkalinity |  |  |  |
| Dissolved Oxygen |  |  |  |

Reasons: