

SNC1D: SUSTAINABLE AQUATIC ECOSYSTEMS

Grade: 9

Subject/Course: SNC1D

Topic: Biology: Sustainable Ecosystems (Aquatic)

Time: 60 minutes

Curriculum Expectation:

- B2.1 use appropriate terminology related to sustainable ecosystems, including, but not limited to: *bioaccumulation, biosphere, diversity, ecosystem, equilibrium, sustainability, sustainable use, protection, and watershed*;
- B3.5 identify various factors related to human activity that have an impact on ecosystems, and explain how these factors affect the equilibrium and survival of ecosystems;
- A2.1 identify and describe a variety of careers related to the fields of science under study and the education and training necessary for these careers.

Hook | Deepwater Horizon spill video | 5 min

Activity | Human Effects on Ecosystems | 35 min

Consolidation | Evaluation of Lake Health | 20 min

Instructions

Hook | Deepwater Horizon spill video (5 mins)

1. Play video of underwater footage of Deepwater Horizon spill. Ask students to identify what it is. Elicit name and any other information students might have.
2. Give students some interesting facts about the spill.
3. Ask student how they think the spill affected the environment. This question leads into the main lesson.

Activity | Human effects on ecosystems (35 mins)

1. Teacher leads a brainstorming session on the possible environmental effects. Elicit that animal species were worst affected. Class discussion on how an oil spill can affect animal (and plant) species.
2. Go through 3 damaging effects of an oil spill using birds as a specific example.
3. Brainstorm other human disruptions of ecosystems (particularly aquatic) that they can think of.
4. Link to next environmental problem – eutrophication. Show students video of Lake Erie’s eutrophication problem.
5. Ask the students what has happened to Lake Erie (does anyone know why this is happening or the name of this process)? Eutrophication. Ask students to think about what effects of all this algae on the lake surface might have. Animals/plants die. Why? Elicit that sunlight cannot penetrate the surface of the lake, plants die, deoxygenate the lake, and then fish die further deoxygenating the lake.
6. Activity: Explain that students now have the chance to become freshwater ecologists. This is a good opportunity to discuss the career paths and how students could become ecologists. Ask students to think about what type of measurements they might take to tell whether a lake is healthy or not. Explain that they will measure visibility, nutrient load, oxygen levels, and variety of animal species and population numbers. Divide students into groups of 3-4. One student from each group can volunteer to be the ecologist – this student will come to the front and make a measurement; the other students will be data recorders.
7. Follow the activity, visiting both lakes and making the appropriate measurements. Upon completion, have students work in their groups to analyze their data – this can be as in depth as the teacher wants (students could present their data visually, or write a report to the Ministry). Students must conclude which lake is healthier and provide a hypothesis as to why.

Consolidation | Evaluation of Lake Health | 20 mins

1. As a class, review results of lake study for each lake. Which lake is healthier? Students should see that the lake closest to farm land is the unhealthiest. What conclusions can we make from this study? Agricultural land inputs too much of a nutrient load into a lake and causes a decrease in fish populations.
2. Have students complete the discussion questions, either individually or as a group. Can be assigned for homework.
3. Wrap up slide – take home message. This slide could be removed and students could provide take home message via ticket-out-the-door activity.