

Problem-Based Learning Unit Template

Topic

Matter

Goals/Objectives

5.4 The student will investigate and understand that matter is anything that has mass and takes up space; and occurs as a solid, liquid, or gas. Key concepts include

- a) distinguishing properties of each phase of matter;
- b) the effect of temperature on the phases of matter;
- c) atoms and elements;
- d) molecules and compounds; and
- e) mixtures including solutions.

4.5 The student will investigate and understand how plants and animals, including humans, in an ecosystem interact with one another and with the nonliving components in the ecosystem. Key concepts include

- a) plant and animal adaptations;
- b) organization of populations, communities, and ecosystems and how they interrelate;
- c) flow of energy through food webs;
- d) habitats and niches;
- f) influences of human activity on ecosystems.

Theme

Lowering pollution and improving the health of the James River.

Scenario

SHOCKING NEWS! <http://vimeo.com/65535861> The effects of pollution can be seen throughout our surroundings. This video was shot in April of 2013!

Pollution of our water sources has become a large problem and is causing great harm to our environment. The US Environmental Protection Agency has hired your team to research the environmental impact of pollution in the James River and help design a device to filter as many pollutants as possible from the water. Your research team will present their filtering devices and data on its effectiveness to representatives from the US Environmental Protection Agency.

Culminating Activity

Students will design an environmentally friendly device to filter as many pollutants as possible from the water. Your research team will present their filtering devices and data on its effectiveness to representatives from the US Environmental Protection Agency.

Problem Question

What can be done to filter pollution from the James River to make it a healthier tributary to the Chesapeake Bay?

Student Role

Students will be designing filters for pollution and then test those filters for effectiveness. They will then present their findings to the US Environmental Protection Agency.