

Integrative STEM Education

Environmental Technology: Water

FESTO



Highlights

- Simulate a polluted river
- Develop a treatment plan to turn a polluted river into a source of freshwater
- Identify biological needs and social consequences of water availability
- Calculate a personal water footprint
- Demonstrate the water cycle
- Demonstrate the process of softening hard water

STEM Connections

In the STEM Environmental Technology/Water course, students discover how the four disciplines connect as they perform standard water testing and treatment methods.

They also explore how human activity has affected some aspects of the environment.

Science

- Chemistry
- Biology
- Ecology and environmental science
- Earth science
- Laboratory procedures and practices

Technology

- Freshwater treatment methods
- Wastewater treatment methods
- Tools used for water quality measurements

Engineering

- Apply the design process/scientific method to develop a solution
- Implement technology to solve real-world problems
- Conduct freshwater and wastewater treatment research

Math

- Units of measurement
- pH calculations
- Algebraic applications in science

Integrative STEM Education

Environmental Technology/Water

STEM Environmental Technology/Water

The purpose of the STEM Environmental Technology/Water course is to introduce the students to the basic principles of water testing and treatment methods, and to explore how human activity has affected some aspects of the environment which impact water directly.

Both potable (drinking) water and waste water are addressed in this course.

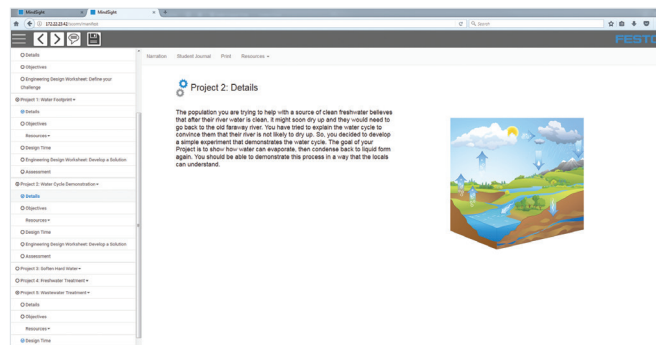
Upon completion of the STEM Environmental Technology/ Water course, students will be able to:

- Demonstrate laboratory skills necessary for water testing and treatment.
- Apply the engineering design process and scientific method.
- Evaluate the problem using knowledge from biology, chemistry, and physical science backgrounds.
- Explore how the living things on Earth use water.
- Define issues that face the current state of the water supply.

Equipment and Supplies

- Multimedia Presentation
- MindSight Installation and User Guide
- Environmental Technology Trainer
- Graduated cylinder (100 mL)
- Small marbles
- Large marbles
- Kitchen strainer
- Rubber mat
- Wide-mouth jar with lid
- Stainless steel spoon

MindSight LMS



- 10-L plastic bottle
 - 4-L plastic bottle carboy
 - Polypropylene apron
 - Safety glasses
 - Large funnel
 - 10-mL syringe
 - 30-mL plastic bottle
 - 250-mL bottles with lids
 - 600-mL beaker
 - 4-L plastic bottle
 - Cork
 - 12-inch/30-cm plastic ruler
 - Clip-on sun lamp
 - A&D Scale
 - Oakton pH tester
 - Kit pool test
 - MW 600 Dissolved Oxygen tester
 - Environmental Technology/
Water
 - Consumables
 - Set (100) of large metal paper clips
 - Set (100) of plastic paper clips
 - 1-G distilled water
 - 1-kg molasses
 - Set (24) birthday candles
 - Red food coloring
 - 1.89-L cooking oil
 - 8-oz liquid dish soap (not for dishwashers)
 - Set (36) colored pencils
 - Set (12) black grease pencils
 - Set (24) plastic teaspoons
 - pH7 buffer solution
 - 125-mL lemon juice
 - 500-mL milk of magnesia
 - 36-tablet Alka-Seltzer
 - 3.6-L Chlorine bleach
 - 500-mL vinegar
 - 500-g baking soda
 - 2-lb Epsom salt
 - 3-kg Arm & Hammer washing soda
 - Set (100) 1-oz plastic cups
 - Set (100) plastic cup lids
 - 750-rol masking tape
 - 4-lb sugar bag
 - 1.5-lb Miracle-Gro fertilizer
- Optional discovery items*
- 500-mL Erlenmeyer flasks
 - One-hole rubber stopper
 - Thermometers
- *These items may be borrowed from a chemistry lab
- For more information or to see a list of all equipment, visit www.astlabs.com
- AST Labs**

Optional discovery items*

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- One-hole rubber stopper
- Thermometers

*These items may be borrowed from a chemistry lab

For more information or to set up a complimentary consultation:

AΣT*Labs*

888.768.4550 | info@AETLabs.com

Festo Didactic Inc.

Eatontown, NJ 07724
Phone: +1-732-938-2000
Toll Free: +1-800-522-8658
Fax: +1-732-774-8573