

LESSON PLAN

Mimi McClure – Apopka Middle School, Apopka, FL

- Lesson Title:** Water, Water Everywhere But Do You Want To Drink?
- Grade Level:** Middle School
- Topic:** Water Purification
- Time Required:** 5 Class periods (1 week)
- Objectives:** Students will determine whether lake water (river/reclaimed) becomes safe to drink using various filter systems and chemical tests.
Students will compare results with prices to become more consumer savvy.
- Materials:** Outdoor (camping style) water filtration devices:
1. Goghlan's replaceable filter system \$19.96
2. Goghlan's tablets \$3.96
3. Sweetwater replaceable filter system \$ 59.96
4. Coleman's replaceable filter system \$ 36.95
Water analysis kits (pH, ammonia, nitrate, dissolve oxygen, lead, copper, phosphate, and suspended solids)
Microscopes
Protist identification chart
- Procedure:** Day 1 - Break up the class into five groups according to the following breakdown:
Group 1 – I.D. protists and record each of the other group's data onto the computer.
Group 2 – Test for pH and lead
Group 3 – Test for ammonia and copper
Group 4 – Test for nitrate and dissolved oxygen
Group 5 – Test for (ortho)phosphate and suspended solids
Test and establish standards and procedures in labs and analyze city water sample.
- Day 2 - Each group goes into the field to collect water samples at pre-designated sites. Each group will be responsible for performing their specific tests each day on water filtered through different purification systems. This day serves to show the students how to sample for water and further

demonstrate the correct procedure for water analyses while giving them hands-on field experience.

Day 3 - Individual groups execute their specific tests on the two Goghlan products. Water quality tests should be run prior to and after filtration. Results are recorded into a database (Group 1). The filtered water (sample which no water quality chemicals are present in) is then tasted by all for this aesthetic parameter.

Day 4 - Individual groups execute their specific tests on the Sweetwater and Coleman products following the above steps. Again, water is tasted by all for this aesthetic parameter.

Day 5 - Create charts and graphs on the derived data. Compare the results of each filtration device (chemicals present both before and after) with its respective cost. Discuss the comparative data and generate a concluding statement that rates the various systems (similar to what one would see presented in a consumer guide).

An additional day may be dedicated to the analysis of observable packaging versus responsible consumerism.

Data:

**Graph
Spreadsheet
Cost/benefit analyses**

Questions:

- 1. Which "camping style" water filtration system provides the most desirable water?**
- 2. Which system is most cost effective?**
- 3. Are all of the tested systems adequate in producing potable ("drinkable") water?**