Career Academy Teacher Externship Program

What's in the Water?
Water Quality Analysis Lab

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District: Laona School District, Laona, WI

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Overview:

You are employees of competing water testing companies. You recently received a request from the municipality of Cavour to test their water for an unknown/suspected parasite that they suspect has been causing nausea and intestinal distress in their community.

Your mission is to develop the proper Method for testing for the parasite and provide a detailed lab report.

Featured Externship Business:

Northern Lake Service - Environmental Analytical Laboratory

Subject:

Environmental Science, Chemistry, Earth Science, Biology

Grade Level:

8-12

Learning objectives:

After doing this activity, students should be able to:

- develop the criteria for designing a hypothetical EPA/business specific Method for detection of the waterborne pesticide in a municipality water sample
- design the experiment for detection of the waterborne pesticide

Workplace Readiness Skill:

X Social Skills	X Communication
X Teamwork	X Critical Thinking
X Attitude and Initiative	X Planning and Organization
X Professionalism	X Media Etiquette

Type of Activity:

X Individual
X Small group
X Whole class

Time: Three 45-minute Class Periods

NGSS Standards:

MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

Common Core English/Language Arts Standards for Science and Technical Subjects:

CCSS.ELA-LITERACY.RST.9-10.3
Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

CCSS.ELA-LITERACY.WHST.9-10.7
Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

CCSS.ELA-LITERACY.WHST.9-10.1
Write arguments focused on discipline-specific content.

Materials:

- Ward's® Water Quality Assessment Lab Activity Kit
  (Can be obtained on Ward's Science+ website: https://www.wardsci.com/store/product/8892374/ward-s-water-quality-assessment-lab-activity)
- Water samples

Directions:

1. Introduce the activity by describing the different departments/jobs associated with a water testing service. Discuss the biological components of water that can be measured in your water test kit. Discuss the importance of each component and

how it affects the water quality. Explain how their proposals should be presented to the City of Cavour (the teacher) for final approval.

2. Distribute water samples from:

    - o Cavour Municipality Well
    - o Peshtigo River
    - o Road ditch (Highway 8)
    - * Townsend's Home well
    - * Bill's Creek
    - * Kircher Pond

3. Divide students into lab groups representing the different water testing companies.
4. Distribute water test kits. (Ward's Water Quality Kits)
5. Review instructions for using the kits provided by the supplier. Include any safety precautions.
6. Discuss how the measurements for the water samples were similar or different.
7. Working in groups, have each lab group assess one of the lab samples and record their findings on their lab sheets. When the tests are complete, record the data for each group on the board and have students copy the data for other groups on their own data sheet.
8. Have student use the data to establish the procedures they used to develop their Method and present it in a detailed lab report.

Wrap-up:

A detailed lab report, including what was detected, how it was detected and the method used to detect, it should be submitted as a summative assessment.

Extension Activity:

A field trip to Northern Lake Service to observe the different departments involved with water testing could be included with this activity.