

8th Grade Science Lesson Plan

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Objectives:

- Students will apply their knowledge of previous material by independently designing an experiment to identify an unknown object
- Students will read about an experiment that was performed due to an individual's curiosity

Context:

Prior to this lesson, have learned about mass, volume, and density. Students have practiced finding each of these quantities experimentally and theoretically. This activity will allow students to demonstrate their understanding of these quantities by finding the identity of an unknown material using a table of known densities.

Rationale:

In this lesson, students will have the opportunity to connect previous knowledge to a similar situation. First, students will have the opportunity to discuss how to find the mass, volume, and density of an object with their peers. This allows students to review previously covered material and to participate in a small group learning discussion. Second, students will work independently to design a lab procedure that will provide results sufficient to identify the unknown material. Third, students will work independently to complete their lab and gather data to reach a conclusion about the unknown material.

This lab offers students the ability to have concrete material to supplement the more abstract content focused in theoretical exercises and note taking activities. The well-designed lab is a developmentally responsive tool for middle school students and serves as a natural assessment to help determine a student's mastery of desired concepts. This assignment also reinforces the scientific method and inquiry-based strategies to promote student directed learning and conclusions.

Standards (from Lake Bluff Science Curriculum Outcomes):

- Identify properties of matter
 - o Density
 - o Mass
 - o Volume
- Analyze the physical and chemical properties of a manufactured object

Lesson Flow:

Starter:

- As students enter the classroom, the starter will be displayed using the projector. Students should discuss with their lab group how to solve for the density of an object.

Activity 1:

- The instructor will remind students to turn in any completed assignments.
- The instructor will go over the schedule for the class period and the following weeks.

Activity 2:

- Students will receive their task to identify an unknown material based on the object's density
 - o The instructor will explain how this assignment connects with previously learned material
- The instructor will explain this is an independent assignment
- The instructor will remind students to thoroughly explain their procedure before beginning their lab and thoroughly explain their results at the conclusion of the lab
- Reminders for students:
 - o Work efficiently
 - o Work independently
- Reminders for instructor:
 - o Need to allow 25 minutes for students to complete the lab.

Activity 3:

- When students finish their lab, they will receive a copy of an article about Coffee Rings.
- Students will read the article and answer several questions.
- Since the article is based on an experiment someone did because of curiosity, students will brainstorm different ideas they would like test with an experiment

Assessments:

- Formative:
 - o The instructor will be observing students as they work on the lab.
 - o The instructor will be moving from lab group to lab group observing student work and focus on the activity.

- Summative:
 - Student labs will be submitted. Labs will be graded based on thoroughness of procedure, data collection, and the conclusion with supporting evidence.

Homework:

- Any portion of the lab that is not complete.
- The coffee ring article and idea brainstorm.