

Can You Believe Everything You See?



Annotation:

In this lesson, students will utilize the steps of the scientific method to formulate a research project that tests a claim made by a company in a TV commercial. Students will learn how to properly conduct a research experiment and gain a better understanding of each step involved in the scientific method.

Primary Learning Outcomes

What are the steps of the scientific method? What are the ways in which data obtained from scientific research can be analyzed and presented?

Additional Learning Outcomes

Why is it important to maintain a representative sample when conducting research?

Assessed QCC Standards:

Grade: 9-12

Science

Physical Science

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Topic: Inquiry, Process and Problem Solving

Standard: Uses science process skills in laboratory or field investigations, including observation, classification, communication, metric measurement, prediction, inference, collecting and analyzing data.

1.1 Designs and conducts a scientific experiment that identifies the problem, distinguishes manipulated, responding and controlled variables, collects, analyzes and communicates data, and makes valid inferences and conclusions.

1.2 Evaluates procedures, data and conclusions to determine the scientific validity of research.

Science, Technology and Society

1

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Procedures/Activities

Step1: Duration: 15 minutes

Introduction of lesson to students with homework assignment given to watch TV and report back with a list of three commercials that make some sort of product claim that can be tested in class. This product claim can be either a comparison of two or more products, or can be a claim made about just the product of interest. Make it clear to the students that the commercials that they bring to class should be within reason i.e. no alcoholic beverage commercials or automobile commercials.

Step 2: Duration: 15 minutes

Conduct a discussion reviewing the commercials chosen by the students. In the discussion make sure the students understand how claims can be tested in the classroom. Have the class vote to determine what commercial will be tested as the research project will be done as a class activity.

Step 3: Duration: 15 minutes

According to the product chosen for testing, have students formulate a problem statement and hypothesis for the experiment. Be sure to discuss with the students what information needs to be gathered prior to the formulation of the hypothesis.

Step 4: Duration: 15 minutes

Have the students then design an experiment that tests the product claim made on the television commercial. Students also need to come up with a materials list that will be needed in order to conduct the experiment. It is also important that the students be assigned certain responsibilities to carry out in conducting the experiment. These responsibilities include things such as data compilation, data reporting, design of a questionnaire if needed, as well as clean up at the conclusion of the experiment.

Step5 : Duration: 30 minutes

Conduct the experiment as a laboratory activity. Make sure that the students are aware of what their responsibilities are and carry those responsibilities out.

Step6: Duration: 30 minutes

Have the students analyze the data collected from the experiment then illustrate their results using the graph type that is the most appropriate for their experiment. If a taste test, for example, is conducted, have the students graph preferences based on things such as age, gender, ethnicity, etc. This information can be obtained in the questionnaire that each research subject fills out.

Materials and Equipment

1. Items to be tested need to be purchased from the grocery store. 2. Graph paper to illustrate analysis of data. 3. Colored pencils for students to draw graphs illustrating data. 4. Computers, if available, for the students to summarize and graph the data.

Total Duration

2 hours

Technology Connection

1. Computers with spreadsheet software can be used to analyze data and formulate graphs illustrating data analysis. 2. Internet can be used as a tool for information gathering by students prior to start of the experiment.

Assessment

Assessment of this activity will be observation of the students conducting various aspects of the project. Students should be able to put the data obtained in graphic form such that the result of the analysis is clear. Students will also be required to turn in a log book that documents each step of the lesson as it relates to the steps of the scientific method.