



CAN YOU BELIEVE EVERYTHING YOU SEE?

Written by Amy Rowley and Jeremy Peacock

Annotation

In this laboratory exercise, students will explore the allure of marketing as they use the scientific method to evaluate a popular food-related, science-based television, radio, or print marketing claim.

Primary Learning Outcomes:

Students will be able to identify a testable hypothesis and variables of interest.

Students will be able to develop appropriate procedures to test a hypothesis.

Students will be able to collect, organize, and record appropriate data.

Students will be able to analyze and draw appropriate conclusions from experimental data.

Students will be able to evaluate whether conclusions are reasonable by reviewing all available information.

Students will be able to use evidence to support or refute scientific arguments or claims.

Students will be able to communicate effectively scientific information through written and oral means.

Students will be able to recognize that scientific principles can be applied to everyday decisions.

Students will be able to identify likely faults in science-based or science-related claims.

Students will be able to explain the importance of marketing to the food industry.

Assessed Georgia Performance Standards:

Characteristics of Science

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

SCSh6. Students will communicate scientific investigations and information clearly.



SCSh7. Students analyze how scientific knowledge is developed.

SCSh8. Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:

Duration:

Preparation: 10 minutes

Introduction: 20 minutes

Student Assignment: Adaptable to class schedule

Conclusion: Adaptable to class schedule

Total Class Time: Adaptable to class schedule

Materials and Equipment:

Materials and equipment needs will be determined by the experimental procedures developed by students.

Safety:

Safety concerns associated with this activity will be determined by the experimental procedures developed by students.

Technology Connection:

Students may use all available information resources (*e.g.* internet search, library research, online databases, books, and periodicals) to aid them in completing the assignment.

Procedures:

Teacher Preparation:

Use the attached template to prepare a copy of the *Can You Believe Everything You See?* student handout for each student.

Estimated Time:

10 minutes

Introduction:

Have you ever wondered whether all of the marketing claims you see and hear are true? They all sound so scientific that they must have research to back them up, right? Well, maybe.

- Bounty: “The quilted, quicker picker-upper”
- “Gatorade is thirst aid for that deep down body thirst.”
- Coca-Cola C2: “½ The Carbs, ½ The Cals, All The Great Taste”

Marketing is an important area of food science, particularly in new product development. No matter how many hours or how much quality science goes into the development of a new product, the product cannot be successful without an effective marketing plan. Food marketing involves everything from the



appearance of the package to pricing promotions to television, radio, and print advertising. Often, marketing involves the use of science-based product claims. Any science-based marketing claim must be backed by strong evidence because a false marketing claim exposed by a competitor could be fatal to a product or company.

Provide students with the *Can You Believe Everything You See?* student handout. Explain to them that in this activity they will use the scientific method to evaluate a popular television, radio, or print marketing claim. As a homework assignment, ask students to watch television, listen to the radio, read the newspaper or magazines, and pay special attention to advertisements that include a food-related, science-based marketing claim. Students should select three food-related, science-based marketing claims that they would be interested in testing. Students should record the names of the products, the manufacturers, and the marketing claims to be tested. Each claim may be a comparison of two or more products or a claim made only about the product of interest. The products selected by the students must be readily available consumer products that THEY can legally purchase. Also, the claims must be reasonable for testing within the classroom. **Food-related medical products can only be selected if the claim can be tested without consumption.**

Estimated Time:
20 minutes

Student Activity:

This activity may be completed as a class or in small groups. Students should follow the guidelines provided in the *Can You Believe Everything You See?* student handout to complete the activity. Provide continuous feedback to students and approve the completion of each step before allowing students to move to the next step. Space is provided on the *Can You Believe Everything You See?* student handout for recording due dates and teacher approval.

Estimated Time:
Adaptable to class schedule.

Conclusion:

Students should give an oral presentation to the class that describes the claim tested, experimental design and procedures, results, and conclusion. Students should conclude the presentation with a new, revised marketing claim or slogan based on the experimental results. At the conclusion of the presentations, discuss with students any interesting procedures or findings. In addition, discuss the roles of skepticism and evidence in science and their importance in consumer decision making.

Estimated Time:
Adaptable to class schedule

Assessment:

Assessment should be based on the *Can You Believe Everything You See?* Scoring Rubric.

CAN YOU BELIEVE EVERYTHING YOU SEE? Scoring Rubric

CRITERIA	10	9-8	7-5	4-0	SCORE
Introduction	Introduction is a clear, concise, and thoughtful explanation of the claim to be tested and any needed background information. The purpose of the experiment or the question to be answered during the experiment is clearly identified and stated.	Introduction is a brief explanation of the claim to be tested and any needed background information. The purpose of the experiment or the question to be answered during the experiment is identified, but is stated in a somewhat unclear manner.	Introduction is too brief, unrelated to the experiment, or provides little or no background information. The purpose of the experiment or the question to be answered during the experiment is partially identified, and is stated in a somewhat unclear manner.	Introduction is missing or shows little effort. The purpose of the experiment or the question to be answered during the experiment is erroneous or irrelevant.	_____ Comments:
Materials & Procedures	All materials and equipment used in the experiment are clearly and accurately described. Procedures are listed in clear steps. Each step is numbered and is a complete sentence.	Almost all materials and equipment used in the experiment are clearly and accurately described. Procedures are listed in a logical order, but steps are not numbered and/or are not in complete sentences.	Most of the materials and equipment used in the experiment are accurately described. Procedures are listed but are not in a logical order or are difficult to follow.	Many materials are described inaccurately OR are not described at all. Procedures do not accurately list the steps of the experiment.	_____ Comments:
Experimental Design	Experimental design is a well-constructed test of the stated hypothesis.	Experimental design is adequate to test the hypothesis, but leaves some unanswered questions.	Experimental design is relevant to the hypothesis, but is not a complete test.	Experimental design is not relevant to the hypothesis.	_____ Comments:
Replicability	Procedures appear to be replicable. Steps are outlined sequentially and are adequately detailed.	Procedures appear to be replicable. Steps are outlined and are adequately detailed.	All steps are outlined, but there is not enough detail to replicate procedures.	Several steps are not outlined AND there is not enough detail to replicate procedures.	_____ Comments:
Safety	Experiment is carried out	Experiment is carried out	Experiment is carried out	Safety procedures were	

	with full attention to relevant safety procedures. The set-up, experiment, and tear-down posed no safety threat to any individual.	with attention to relevant safety procedures. The experiment posed no safety threat to any individual, but one safety procedure needs to be reviewed.	with some attention to relevant safety procedures. The experiment posed no safety threat to any individual, but several safety procedures need to be reviewed.	ignored and/or some aspect of the experiment posed a threat to the safety of the student or others.	_____ Comments:
Data	Professional looking and accurate representation of the data in tables and/or graphs. Graphs and tables are accurately labeled and titled.	Accurate representation of the data in tables and/or graphs. Graphs and tables are accurately labeled and titled.	Accurate representation of the data in written form, but no graphs or tables are presented.	Data are not shown OR are inaccurate.	_____ Comments:
Analysis	The relationship between the variables is discussed and trends/patterns logically analyzed. Predictions are made about what might happen if part of the lab were changed or how the experimental design could be changed.	The relationship between the variables is discussed and trends/patterns logically analyzed.	The relationship between the variables is discussed but no patterns, trends or predictions are made based on the data.	The relationship between the variables is not discussed.	_____ Comments:
Conclusion	Conclusion includes whether the findings supported the	Conclusion includes whether the findings supported the	Conclusion includes what was learned from the	No conclusion was included in the report OR shows little	_____

	hypothesis, possible sources of error, and what was learned from the experiment. Conclusion illustrates an accurate and thorough understanding of scientific concepts underlying the experiment.	hypothesis and what was learned from the experiment. Conclusion illustrates an accurate understanding of most scientific concepts underlying the experiment.	experiment. Conclusion illustrates a limited understanding of scientific concepts underlying the experiment.	effort and reflection. Conclusion illustrates inaccurate understanding of scientific concepts underlying the experiment.	Comments:
Spelling, Punctuation and Grammar	One or fewer errors in spelling, punctuation and grammar in the report.	Two or three errors in spelling, punctuation and grammar in the report.	Four errors in spelling, punctuation and grammar in the report.	More than 4 errors in spelling, punctuation and grammar in the report.	_____ Comments:
Participation	Used time well in lab and focused attention on the experiment.	Used time pretty well. Stayed focused on the experiment most of the time.	Did the lab but did not appear very interested. Focus was lost on several occasions.	Participation was minimal OR student was hostile about participating.	_____ Comments:
Total Score (out of 100):					_____



CAN YOU BELIEVE EVERYTHING YOU SEE? *Student Handout*

Introduction:

Have you ever wondered whether all of the marketing claims you see and hear are true? They all sound so scientific that they must have research to back them up, right? Well, maybe.

- Bounty: “The quilted, quicker picker-upper”
- “Gatorade is thirst aid for that deep down body thirst.”
- Coca-Cola C2: “½ The Carbs, ½ The Cals, All The Great Taste”

Now is your opportunity to pick one popular, science-based marketing claim and put it to the test.

Purpose:

To use the scientific method to evaluate a popular food-related, science based television, radio, or print marketing claim.

Assignment:

Step	Due Date	Complete
1. Watch television, listen to the radio, read the newspaper or magazines, and pay special attention to advertisements that include a food-related, science-based marketing claim.		
2. Select three food-related, science-based marketing claims that you would be interested in testing. Record the names of the products, the manufacturers, and the marketing claims to be tested. Each claim may be either a comparison of two or more products or a claim made only about the product of interest. <i>(Note: The product you select must be a readily available consumer product that YOU could legally purchase. Also, the claim must be reasonable for testing within the classroom. Food-related medical products can only be selected if the claim can be tested without consumption.)</i>		
3. Meet with your laboratory group and select the one marketing claim that your group will test. Have your teacher approve your group’s selection.		
4. Identify and record the hypothesis that will be tested.		
5. Meet with your group to develop an experimental procedure that will allow you to test your stated hypothesis. Write a brief outline of your proposed procedure and have it approved by your teacher. You should include in your outline the independent and dependent variables of interest, experimental controls, what data will be collected, and how you will analyze that data.		
6. Write a detailed experimental procedure and list of materials. Have these approved by your teacher.		
7. Set up and conduct your experiment.		

8. Compile and analyze your data. Construct tables or graphs as needed.		
9. Meet with your group to discuss and write up your findings and conclusions. Remember that all conclusions must be based on data collected during the experiment.		
10. Give an oral presentation to the class that describes the claim you tested, your experimental design and procedures, the results, and conclusion. Use visual aids to help in your explanation. Conclude your presentation with a new, revised marketing claim or slogan based on the experimental results you obtained.		