



Claim-Evidence-Reasoning & The Scientific Method

Lesson 1: *The Solve*

Student Handout

Welcome to Claim-Evidence-Reasoning Year 2!

Last year, you explored claims made by two different corporations: the Gorilla Tape company and the Bounty paper towel company. This year, you'll explore a new claim and freshen up your Claim-Evidence-Reasoning skills.

What you say matters

Companies make claims about their products all the time: that their products are “stronger,” “faster,” or “better.” They want to share how great their products are so that you get excited to buy and use them. But companies have a responsibility to make sure the claims they are making are true.



When companies make claims that are *not* true, they can get in serious trouble. Check out [these famous cases](#) of companies whose false claims resulted in lawsuits.

Today, you'll view a commercial that states a specific claim about a product. It's up to you to determine if this company's claim is supported by evidence!

Your challenge today is to:

1. Determine what claim is being made in a TV commercial.
2. Complete the Claim-Evidence-Reasoning guide to analyze the claim.
3. Use the Scientific Method to design and conduct a test to investigate the claim.
4. Present your findings.



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I. Commercial Review

Watch the video of the [Reynolds Wrap commercial](#). Then use the table below to analyze the information provided in the commercial.



Claim-Evidence-Reasoning

<p>Claim: An assertion; a statement believed to be true</p> <p><i>What claim was made in the commercial? Did they make more than one claim? Which are testable?</i></p>	
<p>Evidence: Scientific data used to support the claim</p> <p><i>What evidence, if any, was presented in the commercial to support the testable claim?</i></p>	
<p>Reasoning: How the evidence connects to the claim</p> <p><i>How does the evidence support the testable claim? Was any reasoning provided?</i></p>	



II. Testing the Claim Using the Scientific Method

Let's investigate whether the claim is supported by evidence by designing and carrying out our own scientific experiment!

The Scientific Method

1. Question to Test

What question will you test based on the claim made in the commercial?

2. Hypothesis

The expected outcome of an experiment that is used as a starting point for further investigation. It is written as an If-Then Statement.

3. Experiment Design

Brainstorm how you could test your key question. What qualitative and quantitative data will you be collecting?



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4. Materials Required

-
-
-
-
-

5. Variables

Variables are factors that can change the outcome of an experiment.

A. Variables to Consider

-
-
-
-
-
-

B. Control Variables: Factors to keep the same during the experiment in order to make this a “fair test”

-
-
-
-

C. Independent Variable: *What factor will change in this experiment?*

D. Dependent Variable: *What factor will be measured as a result of the independent variable?*

6. Procedure

Write a step-by-step procedure for how you will conduct your experiment.



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7. Test

Conduct your test, gather data, and make observations.

8. Data

Review the definitions below for the two types of data that scientists can collect during an experiment. In the space next to each term, list examples of each type of data that could be collected in our experiment.

A. Quantitative Data
Measurable data collected with instruments (such as rulers, balances, thermometers, etc.)

B. Qualitative Data
Observations that allow the scientist to use their senses (touch, smell, hearing, and sight) to collect information

C. Create a data table, drawing, or other visual that represents your test data.

D. Create a graph on a sheet of graph paper to illustrate your data.



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9. Conclusion & Reasoning

Analyze your results. Did your scientific test help to support or refute the claim made in the commercial? Be sure to support your analysis by using your scientific data (evidence) above.

III. Apply Your Knowledge

Read through the Moldaway experiment twice. During your second read, annotate the experiment as follows:

1. A claim is an assertion or a statement believed to be true. **Circle** the claim.
2. Evidence is scientific data used to support the claim. Put a **box** around the evidence.
3. Reasoning is a statement or statements that connect the evidence to the claim. Draw an **arrow** to the reasoning.
4. A hypothesis is the expected outcome of an experiment that is used as a starting point for further investigation. It is written as an If-Then Statement. Draw a **star** next to the hypothesis.
5. An independent variable is a factor that the scientist changes. Underline the independent variable and label it with "IV".
6. A dependent variable is a factor that is measured by the scientist and depends on the independent variable. Underline the dependent variable and label it with "DV".
7. Qualitative data is data that is not measurable. It is collected using the senses (touch, smell, taste, hearing, and sight). Draw an **eyeball** next to the qualitative data.
8. Quantitative data is measurable data that is collected with instruments (examples: temperature, height, mass, and volume). Draw a **number sign** next to the quantitative data.



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Moldaway's Scientific Experiment

Are you tired of the moldy and mildewy smell in your bathroom? One weekly spray of Moldaway prevents mold from growing on your bathroom tiles better than a home remedy like vinegar and water.

If Moldaway is applied to your bathroom tiles, then less mold will appear than on tiles that are sprayed with a homemade solution.

To test this claim, on the back wall of the shower where the water doesn't reach, I sprayed the bathroom tiles with different types of cleaning solutions:

- I sprayed 10 bathroom tiles with 1 spray of Moldaway once per week.
- I sprayed another 10 bathroom tiles in the same area with a homemade vinegar and water solution once per week.



I showered daily with the vent on and left the bathroom door open when not in use. Every other week, I measured the number of tiles with mold.

Data/Observations

	Week 2	Week 4	Week 6	Week 8	Week 10
Tile Set A <i>Treated with Moldaway</i>	No mold present	No mold present	1 tile displays mold <i>Mold is light green, slimy</i>	1 tile displays mold <i>Mold is light green, slimy</i>	1 tile displays mold <i>Mold is light green, slimy</i>
Tile Set B <i>Treated with a homemade vinegar and water solution</i>	No mold present	No mold present	1 tile displays mold <i>Mold is light green, slimy</i>	2 tiles display mold <i>Mold is dark green, slimy</i>	3 tiles display mold <i>Mold is very dark green, slimy</i>

As shown in the data, tiles treated with Moldaway had less mold over a 10-week period than tiles treated with the homemade solution.

Because tiles treated with Moldaway had less mold than the tiles treated with the homemade solution, this supports the idea that Moldaway prevents mold from growing on bathroom tiles better than a home remedy like vinegar and water.



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Name: _____

Date: _____

IV. Quiz: Exit Ticket

Circle the best answer for each question, or you can take the quiz online!

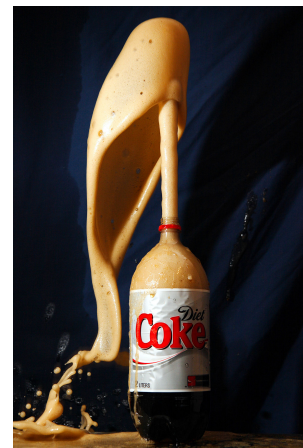
1. The statement “Charmin is the softest 2-ply paper towel ever made” is an example of:
 - a. Evidence
 - b. Reasoning
 - c. A claim
 - d. A hypothesis
2. Which of the following could be a hypothesis for an experiment testing washable watercolor markers?
 - a. Washable watercolor markers come in various colors.
 - b. If watercolor markers are washable, then you should be able to wipe the marker ink from a wall with a wet sponge.
 - c. The average length of time that washable watercolor markers last is 2 weeks.
 - d. Draw one line with each of the colors of washable watercolor markers on the wall.
3. Joey wants to determine if Dawn dishwashing soap is more effective than Palmolive. In order to conduct an accurate experiment, what will be the independent variable?
 - a. Type of pan
 - b. Type of pan, size of pan, type of dishwashing soap, amount of dishwashing soap, amount of time soaked
 - c. Amount of time soaked and amount of dishwashing soap
 - d. Type of dishwashing soap
4. True or False: In a controlled experiment, more than one variable should be changed in order to conduct an accurate experiment.



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5. Your class is conducting a chemistry experiment to test whether Mentos makes larger geysers in Coke or Diet Coke. All of the following are **quantitative** observations in a chemistry experiment *except* for:
- As the Mentos sank to the bottom of the bottle, the Diet Coke appeared to fizz more.
 - The starting temperature of Diet Coke was 85 degrees F.
 - The height of the Diet Coke geyser reached 1.5 meters.
 - 900 mL of Diet Coke remained in the bottle after the eruption.
6. Charlie claims that Dove Body Wash leaves skin more moist than all other brands. Which of the following should be documented as evidence to support this claim?
- The size of body
 - The type of skin
 - The moisture of the skin before and after using each body wash
 - The amount of body wash used








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Appendix A: Claim-Evidence-Reasoning Guide

Term	Definition
CLAIM 	An assertion; a statement believed to be true
EVIDENCE 	Scientific data used to support the claim Evidence can include: <ul style="list-style-type: none">• Quantitative Data such as:<ul style="list-style-type: none">◦ Measurements◦ Calculations◦ Statistics (survey results)• Qualitative Data such as:<ul style="list-style-type: none">◦ Microscopic drawings◦ Written observations◦ Labeled diagrams
REASONING 	How the evidence connects to the claim Sentence starters that can help you connect your evidence to your reasoning: <ul style="list-style-type: none">• Because the evidence shows _____, this means _____.• Because the evidence demonstrates _____, this confirms _____.• If _____, therefore _____.