

## Lesson Plan



### Is Science in You? The Science Behind Gatorade:

#### Annotation

In this presentation and writing exercise, students review the scientific method by studying the development of Gatorade sports drinks. Through a presentation combining lecture and video, students will learn how the scientific method was applied by the scientists who developed Gatorade. Following this presentation, students will apply their knowledge of the scientific method and experimental design to write a research proposal that addresses a question stemming from the Gatorade research.

#### Primary Learning Outcome:

How is the scientific method applied in real life?

Additional Learning Outcomes:

#### Assessed QCC:

Grade: 9-12

Science

Environmental 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.

#### Non-Assessed QCC:

Standards: Local and/or National

#### Total Duration:

30-60 minutes. Adaptable to class schedule.

#### Materials and Equipment:

Student worksheet, laboratory notebook, pen or pencil

#### Technology Connection:

Science Behind Gatorade MS Powerpoint Presentation, computer with MS Powerpoint and internet access, PC compatible

#### Procedures:

##### **Step One – Present “Gatorade: The Science Behind the Drink” Powerpoint Slide Show**

Slide show outline and teacher instructions:

- Title Slide: “Gatorade: The Science Behind the Drink”
- “Are These Statements True?”
  - Click mouse to bring up question 1.
  - Click mouse to bring up question 2.
  - Click mouse to bring up “YES!”.

- Discuss that these questions were answered by Gatorade researchers using the scientific method.
- “All science,..., begins with the scientific method.” Briefly review.
- “Science Begins with Observation”
  - Click “The Gatorade Story” link to open Gatorade.com.
  - Click “HOW THE LEGEND BEGAN.”
  - Click in new window to begin.
  - Navigate through video clips by clicking on the green arrow icon.
  - After final clip, close window to return to Gatorade.com.
  - Click “THE LEGEND CONTINUES.”
  - Close Gatorade.com window and return to slide show.
  - Review information on slide.
- “Scientists Ask a Question and Look for Available Data”
  - Review slide.
- “Scientists Form a Hypothesis”
  - Review slide.
  - Click “What’s in Gatorade and why?” link to open GSSI video.
  - Following video, close window to return to slide show.
- “Scientists Test the Hypothesis”
  - Review slide.
  - Click “Modern testing...” link to open GSSI video.
  - Following video, close window to return to slide show.
- “Results”
  - Review slide.
- “Conclusions”
  - Review slide.
  - Click “How does Gatorade compare?” link to open Gatorade.com.
  - Review graph.
  - Return to slide show.
- “What’s Next?”
  - Review slide. Wrap up concepts of scientific process.
- “It’s Your Turn!” “Getting Started” “...Getting Started”
  - The final three slide present instruction for the writing exercise.

**Estimated Time:**

*(Give an estimate of the time it will take to complete this step.)*

**Lesson Materials to be Attached:**

Title: Science Behind Gatorade Student Worksheet

Annotation: This worksheet guides student note-taking during presentation and presents instruction for research proposal writing exercise.

**Web Links:**

Title: Gatorade.com

URL: <http://www.gatorade.com>

Annotation: Official site of Gatorade. Includes information on Gatorade products, history, research, and educational resources.

Title: Gatorade Sports Science Institute

URL: <http://www.gssiweb.com>

Annotation: GSSI is a research and educational facility focusing on sports nutrition and exercise science.

Title: Explore Research at the University of Florida

URL: <http://rgp.ufl.edu/explore/v08n1/gatorade.html>

Annotation: Provides a brief history of the development of Gatorade at U of F.

### **Step Two – Student Research Proposal Writing Exercise**

The final three slides of the slide show inform students about their writing assignments. Each student is to imagine that he/she has just been hired as a Food Scientist at the University of Georgia. The first assignment is to write a research proposal for a project based on information learned by the Gatorade research team. The proposal should seek to challenge, confirm, improve, expand, reapply, or refocus the work done by Gatorade scientists. An outline for each proposal might be as follows:

- Formulate a question stemming from the Gatorade research you learned about. (Examples: Are results influenced by marketing plans? Could other additives make drinks more effective? Could drink be applied for other uses? Are all flavors equal?)
- Describe what you know about the question. What did you learn during the presentation?
- What is your hypothesis?
- How would you test your hypothesis? Describe your experimental design (variables, controls, methods, data collection).
- What results would you expect?
- How would you interpret your results? What if you get unexpected results?
- How does your research apply to real life? Why is it important?

Students might work in groups to discuss ideas, but each student should develop an original proposal. The instructor should monitor student progress and provide direction or stimulation when needed.

#### **Estimated Time:**

*(Give an estimate of the time it will take to complete this step.)*

#### **Lesson Materials to be Attached:**

Title: Science Behind Gatorade Student Worksheet

Annotation: This worksheet guides student note-taking during presentation and presents instruction for research proposal writing exercise.

#### **\*Assessment:**

This lesson will be assessed by reviewing student research proposals. Proposals should meet the referenced QCC. Students should demonstrate the ability to apply scientific process and to critically analyze research presented in lesson.

Student Name:  
Class:  
Period:  
Date:

## Student Worksheet

### Is Science in You? The Science Behind Gatorade:

#### *Introduction:*

In this lesson, you will review the scientific method by studying the development of Gatorade sports drinks. You will then apply the scientific method yourself by writing your own research proposal. You will first view a presentation outlining the application of the scientific method in the development of Gatorade. While viewing this presentation, you will need to answer the questions listed below. These questions relate to the scientific process used in the development of Gatorade. You will need the answers to these questions in order to complete your research proposal following the presentation.

#### *Presentation:*

Answer the following seven questions during the presentation.

1. What observation was made by UF coaches and scientists?
2. What question did they formulate?
3. What data were already available?
4. What hypothesis did the scientists form?
5. How was that hypothesis tested?
6. What were the results of that testing?
7. What were the scientists' conclusions?

#### *Student Research Proposal Writing Exercise:*

Now it's your turn to be a scientist! Imagine that you have just been hired as a Food Scientist at the University of Georgia. Your first assignment is to write a research proposal for a project based on information learned by the Gatorade research team. The proposal should seek to challenge, confirm,

improve, expand, reapply, or refocus the work done by Gatorade scientists. Your proposal should follow the outline presented below and should be completed in your laboratory notebook.

- Formulate a question stemming from the Gatorade research you learned about today.
- Describe what you know about the question. What did you learn during the presentation?
- What is your hypothesis?
- How would you test your hypothesis? Describe your experimental design (variables, controls, methods, data collection).
- What results would you expect?
- How would you interpret your results? What if you get unexpected results?
- How does your research apply to real life? Why is it important?

You may work in groups to discuss ideas, but each student should develop an original proposal.

**Web Links:** Check out the following links for more information.

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