

## Scientific Method Virtual Lab - Glencoe

How is a controlled experiment performed?

[http://www.glencoe.com/sites/common\\_assets/science/virtual\\_labs/E16/E16.html](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E16/E16.html)

[http://www.glencoe.com/sites/common\\_assets/science/virtual\\_labs/E16/E16.html](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E16/E16.html)

Journal

What is the problem you are trying to solve?

Form a hypothesis:

What is the prediction you want to test?

Test your hypothesis.

How will you use the computer model to test your hypothesis?

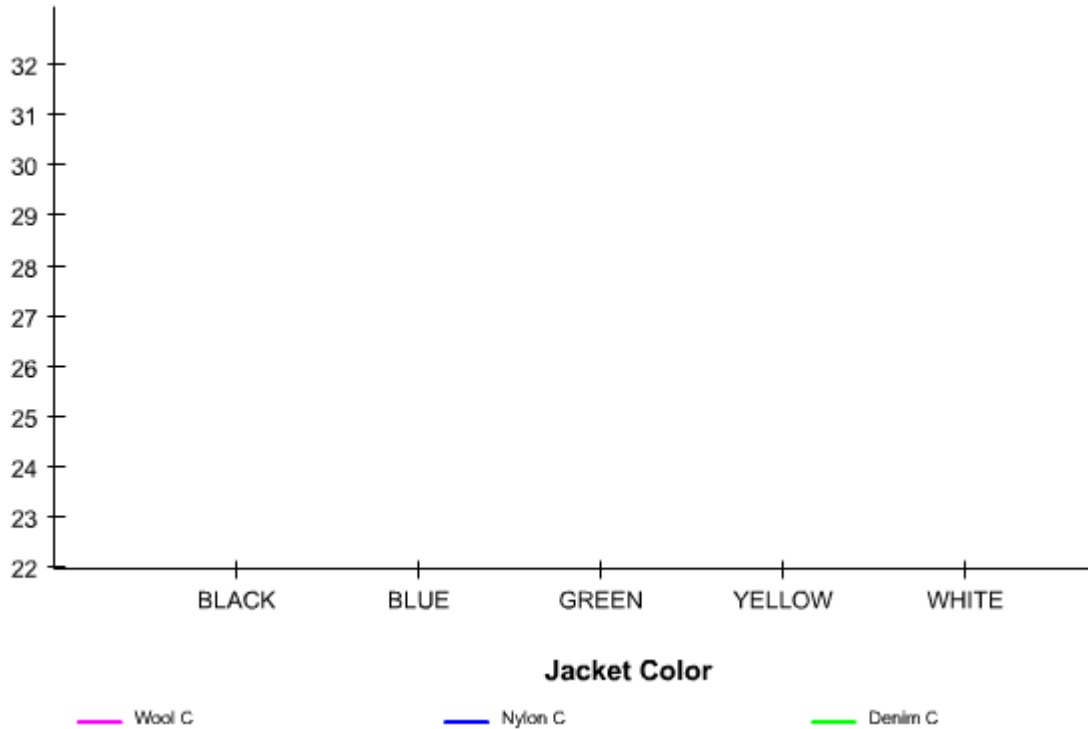
What steps will you follow?

What data will you record?

Conduct your experiment and record your results.

Average Temperature of Jackets			
Jacket Color	Wool °C	Nylon °C	Denim °C
Black			
Blue			
Green			
Yellow			
White			

Analyze the results of your experiment.  
Explain any patterns you observed.



Draw a conclusion.

Did the results of your experiment support your hypothesis?

Why or why not?

How does the material of the jacket affect heat absorption?

Describe the strengths and weaknesses of the computer model you used in the experiment.

What other parameters could you use in such an experiment to determine the effect of color on heat absorption?

## What strategies are involved in solving a science problem?

[http://www.glencoe.com/sites/common\\_assets/science/virtual\\_labs/ES01/ES01.html](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES01/ES01.html)

[http://www.glencoe.com/sites/common\\_assets/science/virtual\\_labs/ES01/ES01.html](http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES01/ES01.html)

Determine the problem.

State what you want to do.

State a prediction you want to test.

Test your hypothesis.

How will you use the computer model to test your hypothesis?

What steps will you follow?

What data will you record?

Be specific about which of the variables you will adjust and when.

Draw a conclusion.

Did the results of your experiment support your hypothesis?

Why or why not?

## **Vaccines**

This needs to be completed on Chrome or Firefox

<http://www.historyofvaccines.org/content/scientific-method>

<http://www.historyofvaccines.org/content/scientific-method>

## **Study Jams**

### **Scientific Method**

<http://studyjams.scholastic.com/studyjams/jams/science/scientific-inquiry/scientific-methods.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/scientific-inquiry/scientific-methods.htm>

Take the quiz at the end.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

## **Inky the Squid and the Treasures of the Scientific Method**

**Play the game**

<http://www.biomanbio.com/GamesandLabs/SciMethodGames/scimethod.html>

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## **Scientific Methods Quizzes**

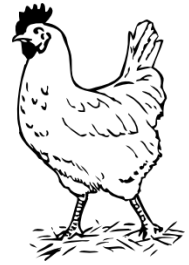
**Take the quizzes**

<http://www.biomanbio.com/GamesandLabs/SciMethodGames/scimethod.html>

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## Scientific Method In Action

### The Strange Case of BeriBeri



*In 1887 a strange nerve disease attacked the people in the Dutch East Indies. The disease was beriberi. Symptoms of the disease included weakness and loss of appetite, victims often died of heart failure. Scientists thought the disease might be caused by bacteria. They injected chickens with bacteria from the blood of patients with beriberi. The injected chickens became sick. However, so did a group of chickens that were not injected with bacteria.*

*One of the scientists, Dr. Eijkman, noticed something. Before the experiment, all the chickens had eaten whole-grain rice, but during the experiment, the chickens were fed polished rice. Dr. Eijkman researched this interesting case and found that polished rice lacked thiamine, a vitamin necessary for good health.*

1. State the Problem
2. What was the hypothesis?
3. How was the hypothesis tested?
4. Should the hypothesis be supported or rejected based on the experiment?
5. What should be the new hypothesis and how would you test it?

#### **How Penicillin Was Discovered**

In 1928, Sir Alexander Fleming was studying Staphylococcus bacteria growing in culture dishes. He noticed that a mold called Penicillium was also growing in some of the dishes. A clear area existed around the mold because all the bacteria that had grown in this area had died. In the culture dishes without the mold, no clear areas were present.

Fleming hypothesized that the mold must be producing a chemical that killed the bacteria. He decided to isolate this substance and test it to see if it would kill bacteria. Fleming transferred the mold to a nutrient broth solution. This solution contained all the materials the mold needed to grow. After the mold grew, he removed it from the nutrient broth. Fleming then added the nutrient broth in which the mold had grown to a culture of bacteria. He observed that the bacteria died which was later used to develop antibiotics used to treat a variety of diseases.

6. Identify the problem.
7. What was Fleming's hypothesis?
8. How was the hypothesis tested?
9. Should the hypothesis be supported or rejected based on the experiment?
10. This experiment led to the development of what major medical advancement?