

# Was Goldilocks Telling the Truth?

## Summary

Students will design an experiment testing the question of whether Goldilocks was telling the truth about the heat retained by the three bowls of porridge.

## Group Size

Small Groups

## Materials

- *Goldilocks and the Three Bears*
- [Was Goldilocks Telling the Truth? Experiment Planning Sheet](#)
- Multiple sets of bowls
- Oatmeal
- Hot water
- Microwave
- Crock pot
- 1 cup and 12 cup measuring cups
- [Was Goldilocks Telling the Truth? Sample Table and Graph](#)
- [Goldilocks Table](#)
- [Goldilocks Graph](#)
- Science journals
- Thermometers

## Additional Resources

### Books

*Goldilocks and the Three Bears*, by Caralyn and Mark Buehner; ISBN 0803729391

## Background for Teachers

The students will need background in the scientific method. The steps in this method are ask a question; gather background research; form a hypothesis; experiment; analyze your data; draw conclusions; and record your results.

It is helpful if the students have already done several guided experiments using this method in class. If not, a planning sheet is provided to allow for differentiation.

Prior to beginning this lesson, set up the oatmeal, bowls, and other materials. Plan enough time to use a microwave or hot plate to heat up the oatmeal and water mixture. You may also want to have a couple of crock pots on hand to keep the oatmeal hot. The ratio for making "porridge" from oatmeal and water is one cup of water to 12 cup of oatmeal. Time for warming in the microwave will vary based on how much is used. Cook on high for three minutes at a time and stir in between.

Students should use a different thermometer for each set of bowls. They should also have a small ice bath available to store the thermometer between readings.

Since the students will be using bowls of different materials in this experiment, they may use any knowledge of insulation materials when making their choice of which to use. If you have multiple sets of bowls, they may choose to test two different materials.

The porridge portion of the story of Goldilocks and the Three Bears will be proven wrong in this experiment. Goldilocks said the big bowl was too hot, the medium-sized bowl was too cold, and the smallest bowl was "just right." The students will learn that bigger things lose heat more quickly and smaller things sustain heat the longest, thus making the big bowl too cold, the small bowl too hot, and the medium- sized bowl "just right."

## Intended Learning Outcomes

2. Manifest scientific attitudes and interests.
6. Understand the nature of science.

## Instructional Procedures

### Invitation to Learn

Write the following instructions on the board: In your journals, write or draw what you remember about the story of Goldilocks and the Three Bears. What does this story have to do with heat?

### Instructional Procedures

Prior to beginning this lesson, prepare the oatmeal/water mixture and set out all supplies, including the microwave or hot plate and saucepan. You may want to warm the porridge before beginning the lesson and keep it warm in a crock pot until using.

Read and share the pictures of *Goldilocks and the Three Bears* by Caralyn and Mark Buehner, or another version of your choosing. A Big Book version may be available at your district media center.

Ask the students what the story has to do with heat. They should recognize the too hot, too cold, and just right temperatures of the bowls of porridge. Reread this portion of the story. Ask the students to think about what they have learned about heat. Is this scenario really possible? Explain that students will design an experiment to test this question. Students should be in groups of three. Steps of the scientific method should be followed. All documentation should be written in their science journals.

Before assigning groups, allow students time to design the experiment on their own. Provide the *Was Goldilocks Telling the Truth? Experiment Planning Sheet* for those students who need some assistance with this process.

Organize the small groups once students have had time to think about the experiment on their own. Students should share their ideas with their group members and come to a consensus on the procedure. They may test two different sets of bowls if enough materials are available.

Begin warming the porridge in the microwave as the students are planning the project with their group members. Exercise safety precautions while using the hot oatmeal and make sure your students do the same.

Before the students begin, discuss some of the following questions: What are the variables in your project? (the size of the bowls) How can you make sure to only test one variable? (the amount of oatmeal in each bowl should be the same) What time intervals are appropriate for temperature testing? (I would suggest 1 12 - 3 minutes between each reading. Stopwatches may be used for accuracy.) How will you record your observations? (tables, graphs, report format)

As the students work, prompt their thinking with questions from the *Was Goldilocks Telling the Truth? Experiment Planning Sheet*. Make sure the students are continually logging their observations in their journals. You may provide the *Goldilocks Table* or *Goldilocks Graph* to help with this process. You may also use the *Was Goldilocks Telling the Truth? Sample Table and Graph* to guide your questions for your students.

When the students finish, ensure that they have written all of their conclusions in their journals. Also ask them to write down any other wonderings as well.

## Extensions

### Curriculum Extensions/Adaptations/ Integration

Try the experiment with substances other than porridge like soup or hot chocolate. Were the results the same?

Record class results in graphs and tables. Have the students determine the average drop in

degrees or the range of temperatures for each bowl.

#### Family Connections

Have students share their rewritten story of Goldilocks with a younger sibling.

#### Assessment Plan

Watch for claims, evidence, and correct data and conclusions in the students' journals.

Instruct students to rewrite the story of *Goldilocks and the Three Bears* using creativity and what they have learned from the experiment.

#### Bibliography

##### Research Basis

Rossman, Alan D. "Managing Hands-On Inquiry." *Science and Children* 31(1993): 35-37.

Science teaching has moved from conventional teaching to actively involving students in meaningful, hands-on inquiry experiences. These experiences are centered on student investigation and problem solving, cultivating positive attitudes toward science and learning in general, and enabling them to learn to think critically and creatively for themselves. With inquiry, teachers become facilitators, not presenters, while students become not passive learners, but participants in the creation of understanding.

Klentschy, M. (2005). Science Notebook ESSENTIALS. *ERIC Source* (ERIC EJ721629). Retrieved November 30, 2007, from <http://www.eric.ed.gov>

Science journals should be a record of students' questions, predictions, evidence, conclusions, and reflections. All should lead to an understanding of "big ideas" of science, as well as act as a literary tool to help students answer questions about the world around them. Language is the most important way for students to arrive at scientific understanding.

#### Authors

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