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ABSTRACT

As students reach junior high school, differences in science attitudes and abilities emerge between boys and girls. This paper highlights the most common differences between boys' and girls' attitudes towards science and discusses some factors that contribute to gender differences in science. Several activities that parents can do with their children at home are described. (CCM)

Gender Differences in Science: How Parents Can Help Close the Gender Gap

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How Do Boys' and Girls' Attitudes and Experiences Differ in Science?

http://npin.org/library/1998/n00085/n00085.html

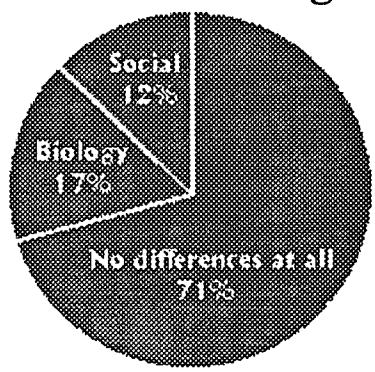
As students reach junior high school, differences in science emerge. This table highlights some of the most common differences between boys and girls in science.

Attitudes	
Are more interested in science	Are not as interested in science
Believe they do well in science because they are smart	Believe they are not as smart in science
Have confidence in their ability	Have little confidence in their ability to do science
Experiences	
More likely to participate in science classroom	Not as likely to participate in the science classroom
Participate in more science related activities outside of school	Not as likely to participate in science related activities outside of school

Do Factors in the Home Contribute to the Gender Difference in Science?

The gender differences in students' science attitudes and experiences are not simply a result of biology (that is, boys are not born with science knowledge. Instead, other factors may play a role. We know that a child's social environment is important for success in science. This environment includes school, home, and social clubs/activities. Children's belief in their ability to do well may depend on the messages they get from their social environment. When high standards are set for young children, the children want to achieve. Boys and girls have been found to have different levels of achievement in science. In fact, influence from the home has been found to be one of the main social factors that leads to the gender gap in science.

Parents with Daughters

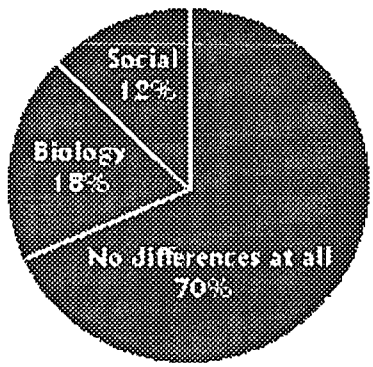


What Do Parents Think?

At the University of Illinois in the Department of Human and Community Development, a study directed by Dr. Jasna Jovanovic, Ph.D., surveyed 197 parents to find out their beliefs about boys' and girls' abilities in science. Parents were asked, "Do you think boys and girls differ in regard to their abilities in science and, if so, in what ways?"

The graphs show that most parents, whether they have sons or daughters, do not think there is a gender difference in children's science abilities. However, of the parents who perceived a gender difference, most believed it was due to innate, biological differences between boys and girls.

Parents with Sons



How Can Parents Help?

Encouragement

- Encourage daughters to be independent, to explore, and to experiment.
- Provide girls with toys such as building blocks, erector sets, and chemistry sets, which encourage facility with spatial

relationships and mechanics.
- Name girls' play as "science," this way, girls will think of themselves as science insiders and increase their science confidence. Therefore, using kitchen utensils, garden tools, and hair appliances should be noted as science oriented.
- Encourage your daughter to participate in the science classroom.

Involvement

- Participate in science-related activities with your child.
- Get involved in your child's schooling. Family involvement in educational activities gives parents a chance to interact with the child, as well as to understand the problems that students often encounter in the learning process.
- Expose your child to the scientific world. If you are in a science field, be sure to take your child to your workplace occasionally. You can be an important role model for your child.

Suggested Readings:

Levenson, E. (1985) Teaching Children About Science. New York: Prentice Hall Press. (All Science Experiments with diagrams cited from this source).

Wasserman, S. and Ivany, J.W. (1988) Teaching Elementary Science: Who's Afraid of Spiders? New York: Harper and Row Publishers.

Russell, Helen. (1990) Ten Minute Field Trips. Washington, DC,: National Science Teachers Association.

Science Activities

Things to do with your child:

- Ask your child to help you plan a meal and make sure all food groups are included.
- Ask your child to help you with measurements for the recipe.
- Take a ten minute field trip with your child to discuss the environment.
- Watch science shows with your child and talk about the ideas.
- Encourage your child to read science magazines and books.
- Take your child to a science museum.
- Plan science experiments that you can do with your child at home. Here are two science experiments to try:

Air Pocket

Materials: A bucket of water; a clear plastic glass; a tissue; newspaper to absorb possible mess from water.

Procedure:
1) Push the tissue into the glass so that it stays in place when the glass is turned upside-down.
2) Tell the child that you are going to have he/she place the glass with the tissue into the water. Ask if he/she thinks the tissue will get wet.
3) Have the child hold the glass upside-down vertically and push it down into the water. Have the child observe that the glass is still dry.

Discussion:
Q: Why can't water enter the glass?
A: Air has already taken up space inside the glass. Air and water cannot take up the same space at the some time.
Q: Why is the tissue still dry?
A: Air takes up space. The
water cannot move into the area that is occupied by the air. The tissue stays dry. The air has formed a pocket around the tissue inside the glass. There is no water inside the glass, only air.

Erupting Volcano

Materials: A basin; an empty salad dressing bottle; warm water; liquid soap; baking soda; vinegar; a teaspoon; a measuring cup.

Procedure:
1) Place the bottle inside the empty basin. Explain that the bottle is a model of the inside of a volcano. The inside of the bottle represents the magma chamber, the neck of the bottle represents the magma pipe, and the opening on top of the bottle represents the crater on top of the volcano where the lava flows out.
2) Have the child add one cup of water to the bottle, then add a few drops of liquid soap to the water. Explain that the water and the soap represent hot bubbly liquid magma inside of the magma chamber deep inside the earth.
3) Have the child add a teaspoon or two of baking soda to the warm water. Explain that the baking soda added to the water sets off a reaction. A gas called carbon dioxide is created when the baking soda dissolves into the warm water. The water inside the bottle is warm and the gas expands. When air or gas expands, it tends to move up. (if a reaction does not occur, add a teaspoon or two of vinegar to the solution inside of the bottle)
4) When the reaction occurs, suds will rise to the top of the bottle and overflow down the sides. Explain that when magma comes to the surface of the earth and flows out of the volcano, it is called lava.

Discussion:
Q: Why does the model volcano stop flowing or erupting?
A: The gas has expanded, and the energy has been expanded. It becomes inactive as it runs out of steam.
Q. When will the model erupt again?
A: When the gases build up again.
Q: What causes the eruption?
A: Gases that heat up and expand cause the eruption to occur. The eruption occurs because of internal pressure. Help your child realize that science is all around them, but most of all...
Have Fun!!!

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