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Earth Science
Grade 4
A Property of Air

Objective/Purpose: Matter includes anything that takes up space and has weight. In this activity students will investigate a property of air by observing and then inferring whether air is matter.

QCC's: 1, 3, 4, 29

Materials/Time Required:

metric ruler
80 cm length of string
scissors
2 round balloons (same size)
safety goggles
straight pin

Background information:

This lesson was taken from the Harcourt Science Book (D4-5). There was a similar lesson in last semester's best lesson book, but the part about this lesson that I liked the best was that it broke down a general concept into a specific concept. There are several properties of air, but this lesson specifically focused on air as being matter and actually showing the students that air is matter. Before starting this lesson it is important that the students have a general idea of matter. I found this lesson to be extremely successful because it basically allowed the students to see air which they thoroughly enjoyed.

Preparation/Procedure:

This activity can be done with the class as a whole, in groups, or in partners. Use the scissors to cut the string into three equal pieces. Tie one piece to the middle of the ruler. Blow up the balloons to approximately the equal sizes. Seal the balloons and tie a piece of string to the neck of each balloon. Tie a balloon to each end of the ruler and hold up the middle string so that the ruler hangs from it. Move the middle string until the balloons are balanced. The next part I recommend either doing yourself or allowing the teacher to assist. Use a straight pin to pop one of the balloons and observe what happens to the ruler. (Expected results: Students observe the ruler move when the other balloon is popped. They should then infer that even though air cannot be seen it has mass.)
Safety Issues:

Students should be cautioned when using the scissors to cut the string. If you would like, you could have the string already cut in pre-measured sections. Also be cautious when using the straight pin. Goggles should be worn when popping the balloon to avoid possible eye injury.

Activity Outline/Teacher Procedures:

Before handing out balloons you should remind students not to blow up balloons that have been in the mouths of other students. This activity works best if students can infer that air is matter on their own, but in those cases where they may not understand it is good to probe the students with questions that may help them in inferring the information. Also it is important to visit all the groups to assist with the procedure and answer any questions they may have.

Possible Questions:

Explain how this investigation shows that air takes up space.
What happened when the balloon popped? What property of air caused what you observed?
What caused the balloon to inflate? (Air pressure on the sides of the balloon.)
What other things is air pressure responsible for? (Keeping tired inflated.)

Assessment/Evaluation:

The possible questions are a good way to assess what the students observed, inferred, and learned. A worksheet would also be a good way to evaluate how well the students grasped the concepts and whether or not they accomplished the goals of the lesson.