



# Properties of Air Activity



## **Starter Questions:**

What is air?

List things in the room that are full of air.

Have you ever felt the force or pressure of air? (Think: filling up balloons or beach balls or bicycle tires.)

## **Part I: Can air take up space?**

### **Materials:**

- \*a wide-mouth jar**
- \*sturdy plastic bag**
- \*string or rubber bands**

1. Put air into a plastic bag by blowing into it or waving it through the air.
2. Clamp the opening of the bag around the mouth of the container and fasten it tightly by either wrapping string around it two or three times or by putting a rubber band around it.
3. In a minute you will try to push the bag into the container. What do you think will happen?"
4. Now, try to push the bag into the container. Describe what you felt as you pushed down on the bag.
6. Remove the bag and place it inside the container, like a liner. Drape the top of the bag over the lip of the container, just like the lining in a trash can. Tie string tightly around it two or three times, or fasten it tightly with a rubber band.
7. In a minute you will try to pull the bag up out of the container. What do you think will happen?"

What happened?

## **Part II: Can you feel air pressure?**

### **Materials:**

- \* **a 12" ruler**
- \* **a newspaper**

### **Procedure:**

1. Place one end of the ruler on a table with slightly less than half the ruler hanging off the edge.
2. Lay a sheet of newspaper over the part of the ruler on the table.
3. What do you predict will happen if the protruding end of the ruler is struck as hard as possible?
  
4. Strike the ruler as hard as you can.

What happened?

5. Calculate the surface area of the newspaper. (Length X Width) Show your work. Use inches for this calculation.
  
6. Multiply the surface area X 14.25 pounds per square inch. Show your work.

The result will be the amount of air pressure exerted on the paper.

**NOTE: Air at sea level exerts a pressure of approximately 14.25 pounds per square inch. Therefore, on a piece of paper 10 inches square the air exerts a pressure of 1,425 pounds on the top surface! The same pressure is also exerted on the opposite surface, counteracting the pressure on the other side.**

7. Predict what would happen if you pushed down on the ruler slowly:
8. Place your hand on the protruding piece of the ruler and slowly push down.
9. Why it was still difficult to move the ruler?
10. Look at your answer to the question "What is air?" Did you find out anything about