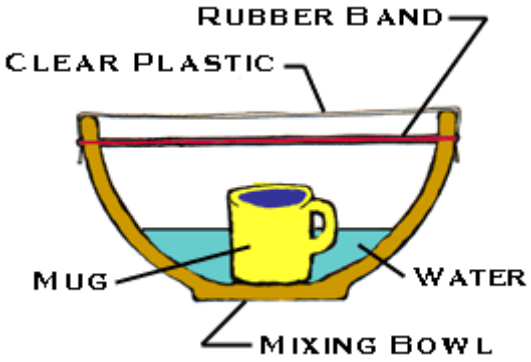
HOUSEHOLD EXPERIMENTS

1. Water Cycle experiment.



Materials

- a large metal or plastic bowl
- a pitcher or bucket
- a sheet of clear plastic wrap
- a dry ceramic mug (like a coffee mug)
- a long piece of string or large rubber band water.

1. Put the bowl in a sunny place outside.
2. Using the pitcher or bucket, pour water into the bowl until it is about ¼
3. full.
4. Place the mug in the center of the bowl. Be careful not to splash any water into it.
5. Cover the top of the bowl tightly with the plastic wrap.
6. Tie the string around the bowl to hold the plastic wrap in place.
7. Watch the bowl to see what happens.

The Science behind the Experiment

The "mist" that forms on the plastic wrap will change into larger drops of water that will begin to drip. (You can speed up the dripping by carefully moving the bowl – don't splash! – into the shade.) When this happens, continue watching

for a few minutes, then, carefully peel back the plastic. Is the coffee mug still empty? Water from the "ocean" of water in the bowl evaporated. It condensed to form misty "clouds" on the plastic wrap. When the clouds became saturated it "rained" into the mug!

2. The floating egg

Materials

- One egg
- Clear container: I used a wide jar, but a tall glass would work and you won't need as much salt
- Water
- A few cups of salt
- Spoon to mix the solution

Step #1:

Place the egg in plain water and talk about whether or not it floats. Pretty simple — it most definitely sinks!

Step #2:

Start adding salt to the water. We added ours little by little, and tested the solution by adding the egg back into the water.

The Science behind the Experiment

The egg won't float in regular water because it's heavier than the water. But adding salt to the water makes the water more dense than the egg, and it floats! We have a book called "Let's Visit Israel," and my 3-year old will talk about this phenomena when we reach the page about floating in the Dead Sea.

3. Dancing Raisins Experiment

Materials

- raisins
- 2 clear glasses
- carbonated water and regular tap water

Procedure

1. Pour some carbonated water into a clear glass.
2. Add some raisins and watch what happens.

The raisins begin rising up to the top of the glass and then going back down again. The kids were mesmerized!

Then we also got out a glass of regular, non-carbonated water to see what would happen and make comparisons.

The Science behind the Experiment

The tiny bubbles of carbon dioxide stick to the raisins at the bottom of the glass and carry them up to the surface. Once enough of the bubbles pop, the raisins sink down again, and then begin collecting more bubbles.

4. Float or sink

Materials

- A bucket full of water
- Different objects: rubber, clips, pins, toys, a balloon, a comb, etc.

Procedure

1. Make your predictions about if the different objects flout or sink.

OBJECT	SINK?	FLOAT?
 STAPLER	X	

2. Introduce them in the water.

3. Check your predictions

5. Sandwich experiment (this experiment is on your Natural Science book)

Hand washing is an important habit to help reduce spreading of bacteria and viruses that may cause sickness. Because germs cannot always be seen, we don't always realize they are even present. This experiment will help give us a visual to help us understand that germs can still impact our health.

Materials

- Three bread slices (if it is possible without preservatives)
- Three Ziploc bags
- Hand soap and water dissolution

Preparation

1. Place 3 pieces of bread in their own separate Ziploc bags. Label one bag "control", one "clean hands" and one "dirty hands"
2. Have a volunteer go wash their hands with soap and water and touch the "clean hands" bread slice.
3. Have one or many volunteers touch the "dirty hands" bread slice.
4. Leave the control bread in the bag.
5. Place in a part of the room where it can easily be seen. Observe changes for 2-4 weeks.

6. Density Tower

Materials:

- Liquid materials (50ml.): Honey, Whole Milk, Dish soap, Vegetable oil, Alcohol.
- Ping-pong ball (optional)
- A funnel (or turkey buster)
- A deep tube glass.

Preparation

1. Pour **equal** amounts of each liquid in the cups. You may want to set the cups in the order you'll add them into the container: honey, whole milk,

dish soap, water, vegetable oil, rubbing alcohol. Add food coloring to the water and the rubbing alcohol for contrast (optional).

2. Start your column by pouring the honey into the cylinder. It's very important to slowly layer the honey into the center of the cylinder. Take your time. Also, make sure they don't touch the sides of the cylinder as you pour. It's okay if the liquids mix a little as you are pouring. The layers will slowly even themselves out because of their varying densities.

3. Use the turkey baster to carefully layer the milk and the dish soap. Again, don't let the liquids touch the sides of the container and add them s-l-o-w-l-y and carefully..

   Starting with the water, hold the tip of the baster against the side of the container close to the layer of dish soap. Squeeze gently so the water flows down the side of the container and onto the dish soap. Move the baster upward as needed. Layer the vegetable oil and the rubbing alcohol, in the same way. Allow the layers to settle and separate even more before moving on to the next step.

4. The Ping-Pong ball will float very nicely on top of the lamp oil. Well done!

The Science behind the Experiment

Density is basically how much "stuff" is packed into a particular volume. It's a comparison between an object's mass and its volume. If the weight (or mass) of something increases but the volume stays the same, then density goes up. Likewise, if the mass decreases but the volume stays the same, then density goes down. Lighter liquids (like water or vegetable oil) are less dense than heavier liquids (like honey or corn syrup) so they float on top of the heavier liquids. The same amount of two different liquids you used in the container will have different densities because they have different masses. The liquids that weigh more (a higher density) will sink below the liquids that weigh less (a lower density).

7. Baloon Pop! Not!

Materials:

- A Balloon
- 2 pieces of tape, each about 2 inches in length
- Small needle or push pin (with adult supervision)

Instructions:

1. Blow up balloon.
2. Use the two pieces of tape to make an “X” on your balloon.
3. Carefully (with parent supervision), push needle through the middle of your “X”.
4. Leave needle in and see how long it takes your balloon to pop.

The Science behind the Experiment

What causes a balloon to pop is called catastrophic crack propagation. This really complicated sounded phrase means that the hole in the balloon widening is what makes it pop, not the fact that air is slowly being let out. When the balloon’s hole gets bigger, it rips and eventually the balloon pops. In this experiment, the tape slow down this process.

Extra Experiments:

Try blowing up the balloon in different sizes. Do the bigger, smaller, or medium sized balloons last the longest?

Try using different kinds of balloons. Water, regular, skinny, round, etc. Which one works the best?

Try doing it without the tape. What is the difference in time of it popping compared to the one with tape?

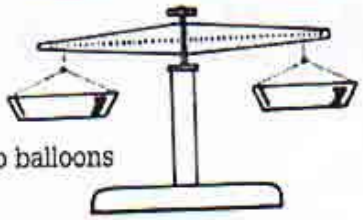
8. **Is air matter?**

Is Air Matter?

OBJECTIVE

Students will determine whether or not air has mass, and is therefore composed of matter or energy.

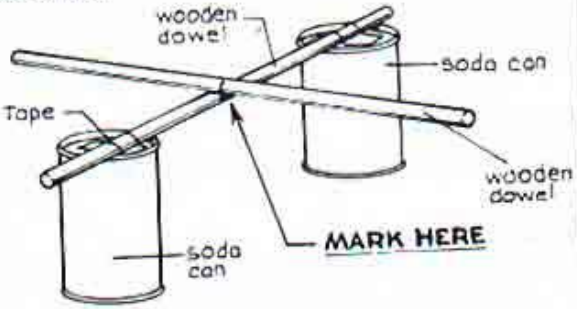
MATERIALS



(per student) copies of pages 34–35
(per class) balance (or equivalent), two balloons

PREPARATION

If you do not have access to a balance, you can make do with a wooden dowel (even a pencil) placed on two soda cans, one at either end of the dowel. Use tape to secure the wood. Take a second dowel and find the balance point so that it sits evenly on the first dowel. Mark it with a permanent marker where they balance. Now you can conduct the demonstration by balancing the balloons on the dowel with identical sized pieces of tape. The rest of the procedure is the same.



VOCABULARY

Mass—property of any object; amount of material in the object

Matter—anything that has mass

DISCUSSION

Explain that anything that is made of matter has a property called mass, which means the amount of material in an object. An elephant has more mass than a mouse. The word *massive* is synonymous with giant size. Introduce the question of air and matter.

EXPLORATION

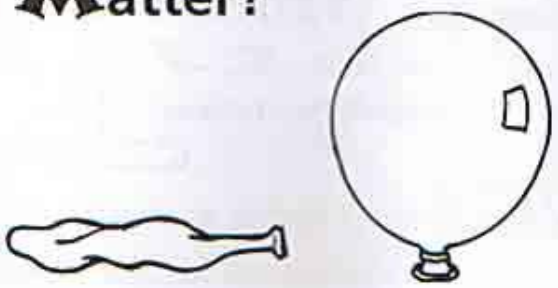
In this activity, students will begin by doing some observations about the air around them. Explain that you are going to find out together if air has mass, and is therefore made of matter, not energy. Then you'll conduct a demonstration. (You should have the apparatus all ready. The students will begin by drawing it.) Use two identical, different colored balloons and a balance. Place the two balloons without air on the balance. Make sure everyone sees that they weigh the same (have the same mass). Now blow up one balloon and the scale will tip toward the one with air. Conclusion: air has mass, therefore it is made of matter.

Extension

Ask students to explain in writing what would happen if one of the balloons was filled with helium gas. Since it floats, does that mean helium has no mass? Helium does have mass, but it is a much less dense substance (see the next lab) than air, so it "floats."

Name _____ Activity Sheet

Is Air Matter?



Question:
Does air have mass?

Materials:
balance
two balloons

For Your Information:
Any object that has mass also has weight if it is on or near the planet Earth. You will observe a demonstration done by your teacher. He or she will see if air has weight. You probably can't feel any weight from the air above and around you. This experiment will prove once and for all if air does weigh anything and if it has mass.

Prediction:
On your record sheet, predict whether or not air has mass.

Procedure:
1. Wave your hand through the air. What do you feel? Record your observations on your record sheet.
2. Hold your hands out in front of you, palms up. Do you feel the air now? Record your observations on your record sheet.
3. Watch the demonstration given by your teacher.

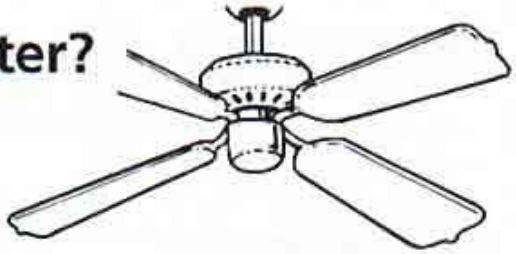
Results:
On your record sheet, draw a picture of the results of the demonstration.

Conclusions:
Answer the following questions on your record sheet:
What happened in the demonstration?

Based on the demonstration, what did you find out about air? Does it have mass? How do you know?

Name _____ Record Sheet

Is Air Matter?



Question:
Does air have mass?

Prediction:
Predict whether or not air has mass. _____

_____

_____

Results:

Draw a picture of the results of the demonstration.

What did you feel when you waved your hand?

_____

_____

_____

What did you feel when you held your hands out in front of you?

_____

_____

_____

Conclusions:
What happened in the demonstration? _____

_____

_____

Based on the demonstration, what did you find out about air? Does it have mass? How do you know? _____

_____

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