



Acids are substances that have a sour taste and strong smell. Lemon juice and vinegar are common acids. Acid rain is formed when pollution in the air mixes with the rain and falls to the ground. In this activity, vinegar will represent acid rain, and an antacid tablet will represent a marble statue in a city park. Both the antacid tablet and marble are made of the same chemical: calcium carbonate.

Materials

Pencil

2 antacid tablets (Look at the ingredients label on the back of the bottle. The active ingredient should be calcium carbonate.)

Small disposable paper plate

2 disposable paper or plastic cups (3 oz)

Masking tape

Marking pen

2 droppers or pipettes

Measuring spoon (tablespoon)

Water

Vinegar

NOTE: It is best to use antacid tablets without any acids among the ingredients. Look on the back of the bottle to see if the word "acid" appears in the list of inert ingredients. Less expensive generic or store brands usually work best for this activity.

ADAPTATION *To prevent spills, a cupcake pan may be used in place of cups. A magnifying glass may be helpful to see the reactions. In addition, a rubber stamp and inkpad may be used to make a design on the antacid tablets—but be sure to use waterproof ink.*



SAFETY: *Be sure to follow Milli's Safety Tips and do this activity only with adult supervision! Do not drink any of the liquid samples in this activity. Keep your face away from the cups. Eye protection must be worn by everyone doing this activity.*

Procedure

1. Using the pencil, draw a face or picture on the smooth side of each antacid tablet.
2. Place the two antacid tablets on a paper plate with your drawings facing up. One of the tablets should be on the right side of the paper plate, and the other should be on the left.
3. Using the masking tape and marking pen, label one cup "water" and the other "vinegar".
4. Ask your adult partner to help you pour 1 tablespoon of water into the cup labeled "water" and 1 tablespoon of vinegar into the cup labeled "vinegar".
5. Use the marking pen to label one of the droppers with a "W" for water and the other dropper with a "V" for vinegar.
6. Using the dropper labeled "W", carefully place three drops of water onto one of the antacid tablets. Watch what happens to the tablet, and write your observations in the "What Did You Observe?" section.
7. Using the dropper labeled "V", carefully place three drops of vinegar onto one of the antacid tablets. Watch what happens to the tablet, and write your observations in the "What Did You Observe?" section.
8. Thoroughly clean the work area. Pour the liquids down the drain, and rinse the containers. Throw away any other trash, including undissolved tablets. Be sure to wash your hands.

Where's the Chemistry?

The tablet treated with vinegar is eaten away in much the same way that acid rain eats away at a marble statue, only faster. The vinegar is reacting chemically with the calcium carbonate in the antacid tablet. The calcium carbonate is used up, and a gas called carbon dioxide is formed. Acid rain is more acidic than normal rain and is caused by pollution in the air.





What Did You Observe?

What happened to the antacid tablet when you dropped water onto it?
Is the picture that you drew on the tablet still there, or did it disappear?

○ Draw a picture of the antacid tablet with water on top.

A large, empty rectangular box with a black border, intended for drawing the antacid tablet after water is added.

○ What happened to the antacid tablet when you dropped vinegar onto it?
Is the picture that you drew on the tablet still there, or did it disappear?

○ Draw a picture of the antacid tablet with vinegar on top.

A large, empty rectangular box with a black border, intended for drawing the antacid tablet after vinegar is added.

The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

