

Another major nutrient in the food we eat is carbohydrates. One of the most popular carbohydrates throughout the world is starch. Starch is the major ingredient in bread, potatoes, rice, and pasta. In the activity below, you can use a simple test to see if a food contains starch.

Materials:

- Crackers (light-colored)
- Rice
- Spaghetti
- Popsicle stick
- Ballpoint pen
- Sheet of white paper
- 5 paper or plastic cups
- 5 Straws
- Wax paper
- Masking tape
- Tincture of iodine
- Tablespoon
- Eyedropper

Caution! Be sure to read and follow all directions and warnings on the tincture of iodine label.

- An adult should make an iodine solution by adding 1/8 teaspoon of tincture of iodine to 2 teaspoons of water.
- Be very careful when using tincture of iodine.
- When you have finished the activity, rinse out all cups and the straw and throw them away.
- Throw away all food items and wash your hands.

Procedures:

1. Cover your work surface with newspaper. On your sheet of white paper, label three areas as follows: cracker, rice, and pasta. Place a small amount of each food on its area of the paper.



2. Use an eyedropper to place 1 drop of iodine solution on each type of food. What do you observe? A dark color shows you that the iodine has reacted with starch in the food. Do all these foods seem to contain starch?

Think about this ...

The iodine test can tell us whether a food contains starch. Let's see whether another kind of iodine test can tell us if one food sample has more or less starch than another.

1. Use your masking tape and pen to label the cups 1, 2, 3, and 4. Use a Popsicle stick to crush a cracker into tiny pieces. Place equal amounts of cracker in each of your four labeled cups. Add 1 tablespoon of water to cup 1, 2 tablespoons of water to cup 2, 3 tablespoons of water to cup 3, and 4 tablespoons of water to cup 4.
2. Use separate straws to stir and mix your crackers with the water in each cup until the cracker has completely fallen apart and is well-mixed with the water.



3. Use a straw to take a few drops from the top of each water/cracker solution. Place 3 drops of each solution on a piece of wax paper as shown.
4. Ask your adult partner to add 1 drop of the iodine solution to the drops of water/cracker solution on the wax paper. Does the color change in any of the solutions? Do all the colors look the same? What explains the difference in color if you saw any?

Where's the Chemistry?

In the first part of the activity, when you placed the iodine solution on the crackers, rice, and spaghetti, the solution should have turned a dark blue color. This change in color is caused by a reaction between the iodine and the starch molecules. This color change tells you that the food you are testing contains starch.

When you tested the four different cracker and water solutions, you should have gotten the most color change in the one with the least water and the least color change in the cup with the most water. Why do you think it works this way?



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".

