

Sec 3

**A**ctivity Chemical Digestion Digestive System  
in the Mouth  
**Going Crackers**

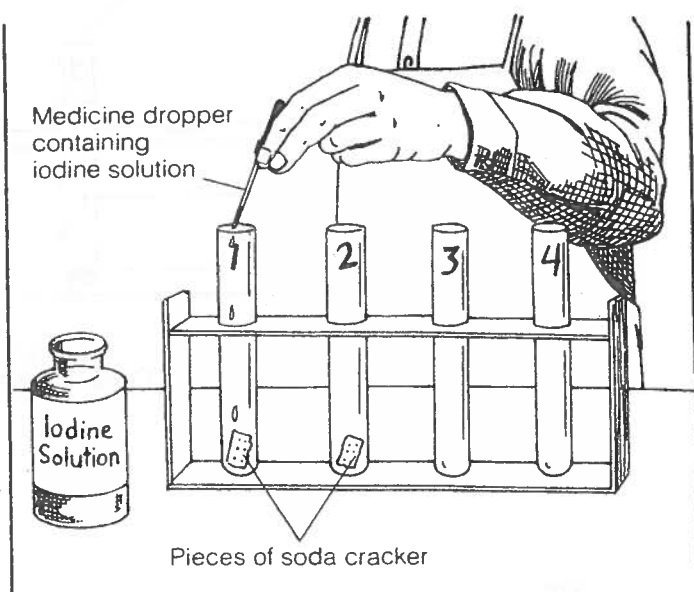
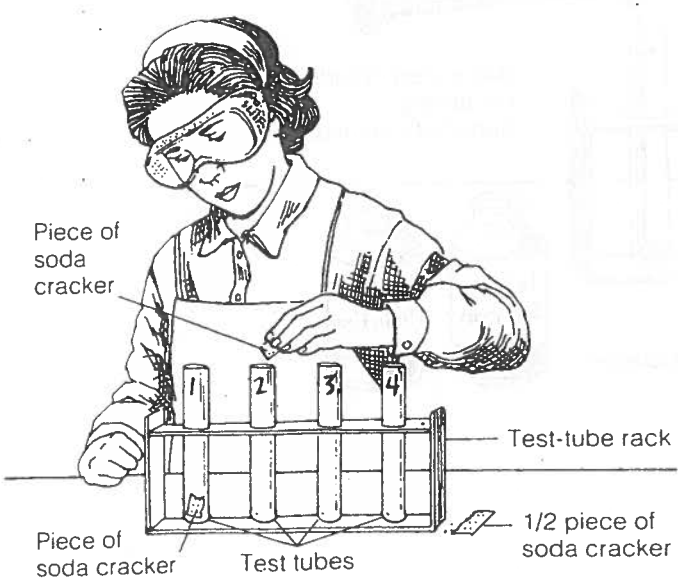
As you might guess from the word itself, carbohydrates are made of carbon (*carbo-*), hydrogen (*hydr-*), and oxygen (*-ate*). Foods that are rich in carbohydrates are the ones that contain starches and sugars. Your body can perform a little "magic" and change the starches into a sugar (called glucose), which you need for energy. In the mouth, a substance in saliva digests (breaks down) starch into sugar. The substance is ptyalin. The following activity will show you how quickly this change takes place in your mouth.

- Materials** (sharpie) drinking cup  
 glass-marking pencil large beaker  
 4 test tubes graduated cylinder  
 test-tube rack Benedict's solution  
 white soda cracker  
 iodine solution  
 medicine dropper  
 spoon

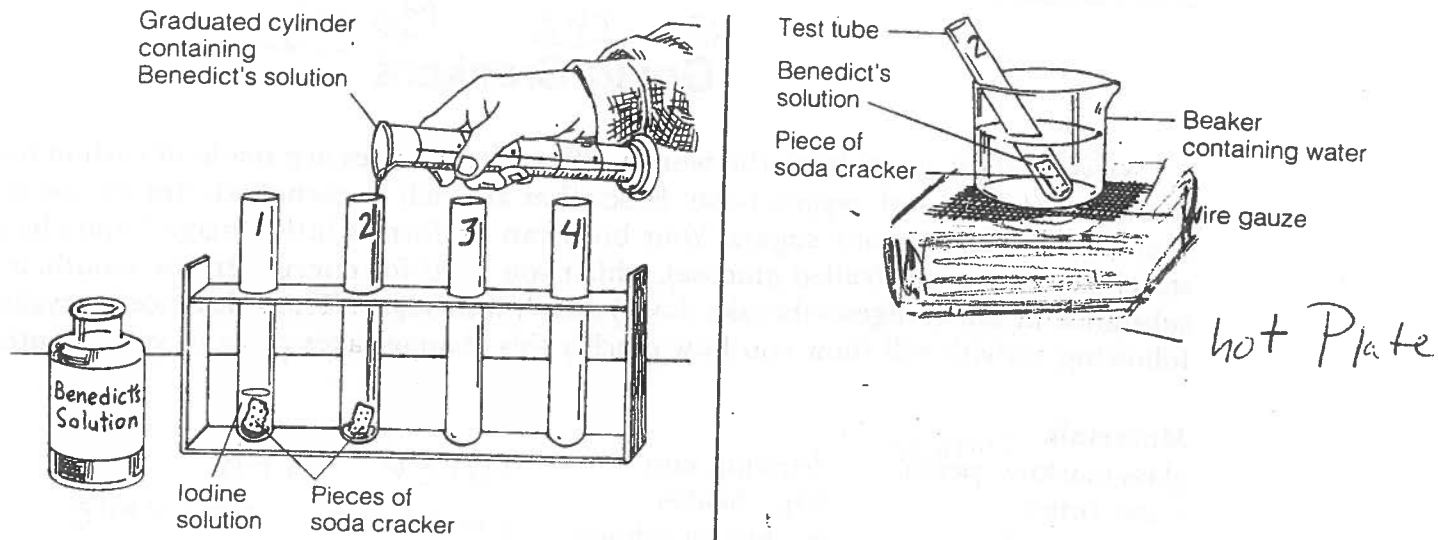
water bath  
 amylase enzyme

**Procedure** 🔪 🍪 🧤

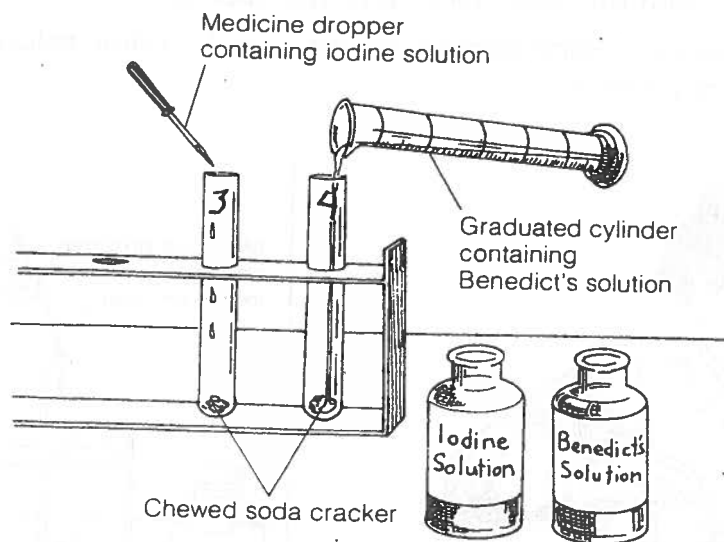
1. With a glass marking pencil, label the test tubes from 1 to 4.
2. Divide a white soda cracker in half. Put one half of the soda cracker aside for use in step 9.
3. Divide the other half of the soda cracker into two equal pieces. Place one piece into test tube 1 and the other piece into test tube 2.
4. Add 3 drops of iodine solution to test tube 1. Iodine solution will turn black in the presence of a starch.



5. Record your observations in the Data Table.
6. Add 5 mL of Benedict's solution to test tube 2.
7. Place the test tube in a beaker of boiling water for a few minutes. **CAUTION:** *Be careful when heating substances.* If the mixture changes color to green or reddish orange, sugar is present.



8. Record your observations in the Data Table.
9. Rinse your mouth out with water and chew on the remaining half of the soda cracker for 5 minutes.
10. After 5 minutes, use a spoon to transfer half of the chewed soda cracker from your mouth into test tube 3 and the other half into test tube 4.
11. Repeat steps 4 and 5 using test tube 3.
12. Repeat steps 6 through 8 using test tube 4.



**Observations**

**DATA TABLE**

Test Tube	Test for Starch or Sugar	Present or Absent
1 (Unchewed cracker, iodine solution)		
2 (Unchewed cracker, Benedict's solution)		
3 (Chewed cracker, iodine solution)		
4 (Chewed cracker, Benedict's solution)		

**Analysis and Conclusions**

1. Why was iodine solution added to test tubes 1 and 3?

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2. Why was Benedict's solution added to test tubes 2 and 4?

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3. How did the soda cracker taste when you began chewing? After 5 minutes?

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4. What happened to the starch in the soda cracker after you chewed it?

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5. What do the results of this activity tell you about what happens to starch in your mouth? \_\_\_\_\_

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6. Compare your results with those of your classmates. Were they similar? Different?

Explain. \_\_\_\_\_

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**Going Further**

You may wish to find out if temperature can affect the rate at which the reaction in this activity takes place. To do this, place an entire white soda cracker in your mouth and chew it a few times. Then divide it equally among 3 test tubes. Place one test tube in cold water, the second in hot water, and the third in water that is at room temperature. Then test the contents of the test tubes for sugar by repeating steps 6 and 7 in the activity.