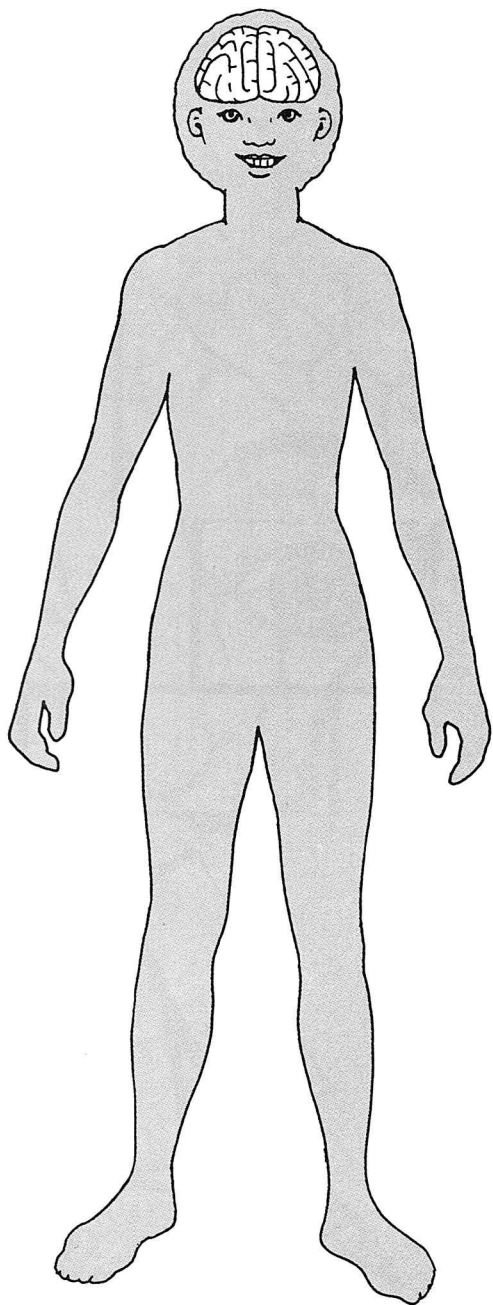


# The Tongue



## Objectives

Students will:

- identify tastes
- learn that cells in taste buds sense tastes
- understand that taste bud cells send electrical signals to the brain

## Building Understanding

1. Ask students which part of the body does the job of tasting.

2. Bring in a variety of foods such as cookies, potato chips, a bar of milk chocolate, a bar of bittersweet chocolate, vinegar, a salted cracker, a dill pickle, fruits, lemonade, etc. Divide students into groups with members of each group tasting the foods. Ask each group to list as many different tastes as they can, then present their results. When all the results are in, explain that there are four main tastes. See if students can determine that the tastes are sweet, sour, salty and bitter.

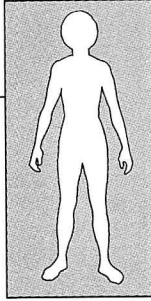
a. Point out that most foods contain a mixture of tastes. Ask students how they would describe the mixture of tastes in lemonade: e.g., sweet and sour.

b. Return to the foods you brought in and start a Sweet Chart, a Salty Chart, etc. with students listing the main taste of each of the foods on the appropriate chart.

c. After lunch have students add the foods they ate to the charts. Have them compile a list of foods they eat for a week, adding them to the appropriate charts.

3. Focus on the Bitter Chart and explain that even though aspirin, black coffee and some foods taste bitter, a bitter taste is often a warning that something is poisonous. Stress that if something they are given to swallow tastes bitter or peculiar they should spit it out until they are sure it is safe to eat. Also remind students that many wild mushrooms are poisonous and

## The Tongue



that as a general rule, when outdoors students should not eat mushrooms or plants.

**b.** Cut out the apple, lemon, etc. and place them in the pouch for use in learning how we taste.

### Making The Model

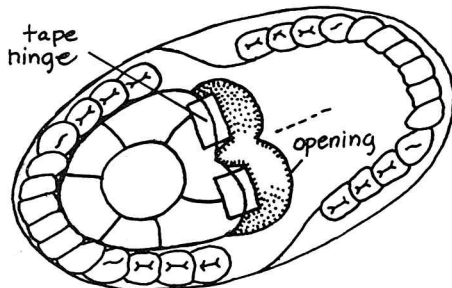
**1.** Reproduce pages 17—19 for each student.

**2.** Have each student locate page 17. Point out where parts are to be cut or taped. Ask what parts of the body are shown: an open mouth, teeth, tongue.

**a.** Along the cut line, cut out the OPENING TO THE THROAT.

**3.** Have students find page 18 and cut out the FOUR TASTES piece and its center. DO NOT throw away page 18.

**a.** Place the cut out piece over the tongue on page 17 and fasten it at the back where it says TAPE by folding tape to form a hinge as shown:



**4.** Have students find page 19 and place it on top of page 17. Fasten the pages together everywhere it says TAPE by folding the tape to form a hinge.

**a.** Cut page 19 in half along the cut line in the middle of the lips.

**5.** Return to page 18 and cut out the pouch along the cut lines.

**a.** Turn the model over and tape the pouch in place on three sides leaving a side open.

### Using The Model

**1.** Ask students to follow along on their model as you explain how the tongue differentiates tastes. Ask students to open the mouth and lift the “tastes” flap. Point to the tongue and explain that it contains taste buds that allow us to taste food. Taste buds are made up of taste cells that sense chemicals in food and send electrical signals along taste bud nerves. All of the taste bud nerves in the mouth join up to carry signals to the taste center of the brain (refer to the model of the brain). The brain decides what we taste and what we should do, such as continue eating or spit out food.

**2.** Ask students to cover again the tongue with the “tastes” flap. Explain that the flap shows where on the tongue each of the four main tastes is best tasted.

**3.** You may wish to mention the following to older students:

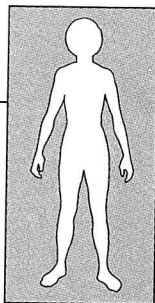
**a.** There are tens of thousands of taste cells in the mouth.

**b.** Most taste buds are located on the surface of the tongue, but some are within bumps called papillae. Large papillae at the back of the mouth are illustrated on the tongue.

**c.** Each taste bud has an opening through which saliva enters carrying chemicals from food.

**d.** Even though each of the four main tastes is best tasted as shown on the Tastes Flap, each taste cell responds to all four main tastes in its own way. Scientists are studying why the four main tastes are best tasted as

## The Tongue



shown and how taste buds signal each taste to the brain.

### More To Do And Learn

#### 1. Color the Model

Suggest that students color the model as well as the different sections of the "tastes" flap.

#### 2. Match That Taste

Ask students to remove the pictures from the pouch on the back of their model and place each where its main taste is best tasted on the "taste" flap. Divide the class into groups and ask each group to draw five foods and cut them out. Have the groups exchange the cut out foods and see if they can match each food to where its main taste is best tasted.

#### 3. Flavor Experiment

Repeat the experiment on page 10 using foods that taste sweet, salty, sour and bitter. Do students find that one of the main tastes contributes more to the flavor of food than the others?

#### 4. Smell Versus Taste

Ask half of your students to list their favorite foods by taste and the other half by smell. Compare their responses. How many foods they say taste good smell good, too?

### Making Connections

1. Divide students into groups and ask them to prepare the following to present to the class:

a. A skit in which one member of the group is a food and the other members are the regions on the tongue

where each of the main tastes is best tasted.

b. Clues to different foods based on taste and where or when the foods are eaten such as, "I taste sweet, I taste sour, you drink

me on hot days, I can be yellow or pink, etc." (lemonade).

c. A report on the different ways insects taste food.

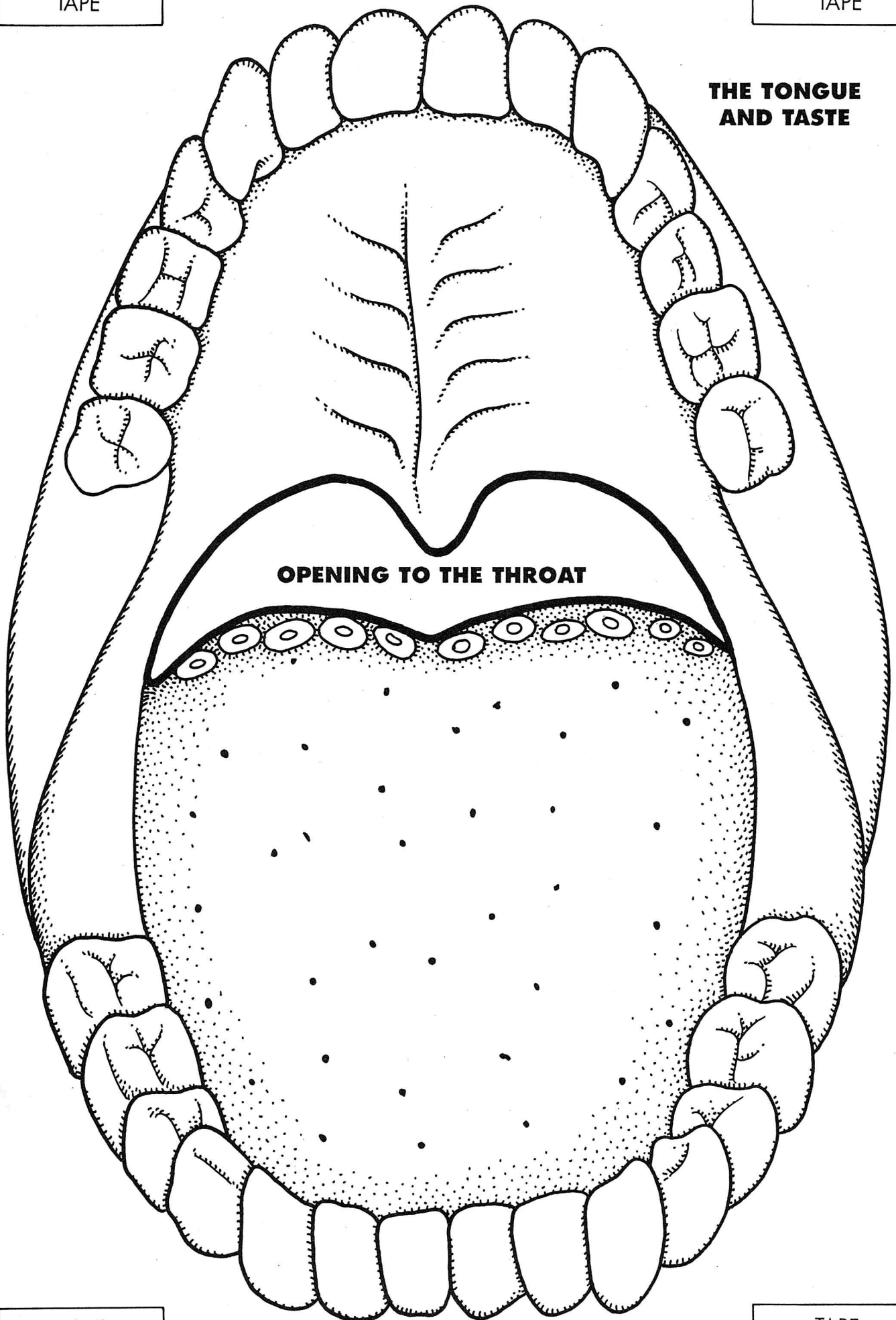
### Staying Healthy

1. Teach students that one side effect of some medicines is making food taste metallic. Abuse of hard drugs can damage taste buds so they no longer sense the bitter taste of poisons. This loss can prove deadly when drug pushers mix the drugs they sell with poisons such as strychnine to increase their profit.

TAPE

TAPE

## THE TONGUE AND TASTE

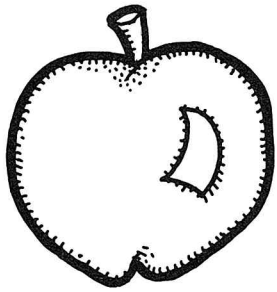


**OPENING TO THE THROAT**

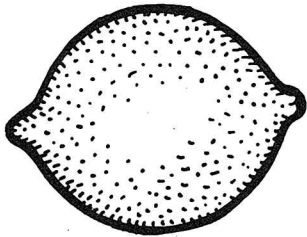
TAPE

TAPE

TAPE



**APPLE**

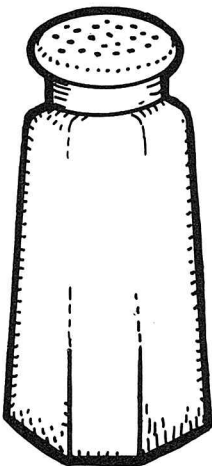


**LEMON**

TAPE

**POUCH**

TAPE



**SALT**



**ASPIRIN**

TAPE

TAPE

**BITTER**

**SOUR**

**SOUR**

CUT THIS OUT

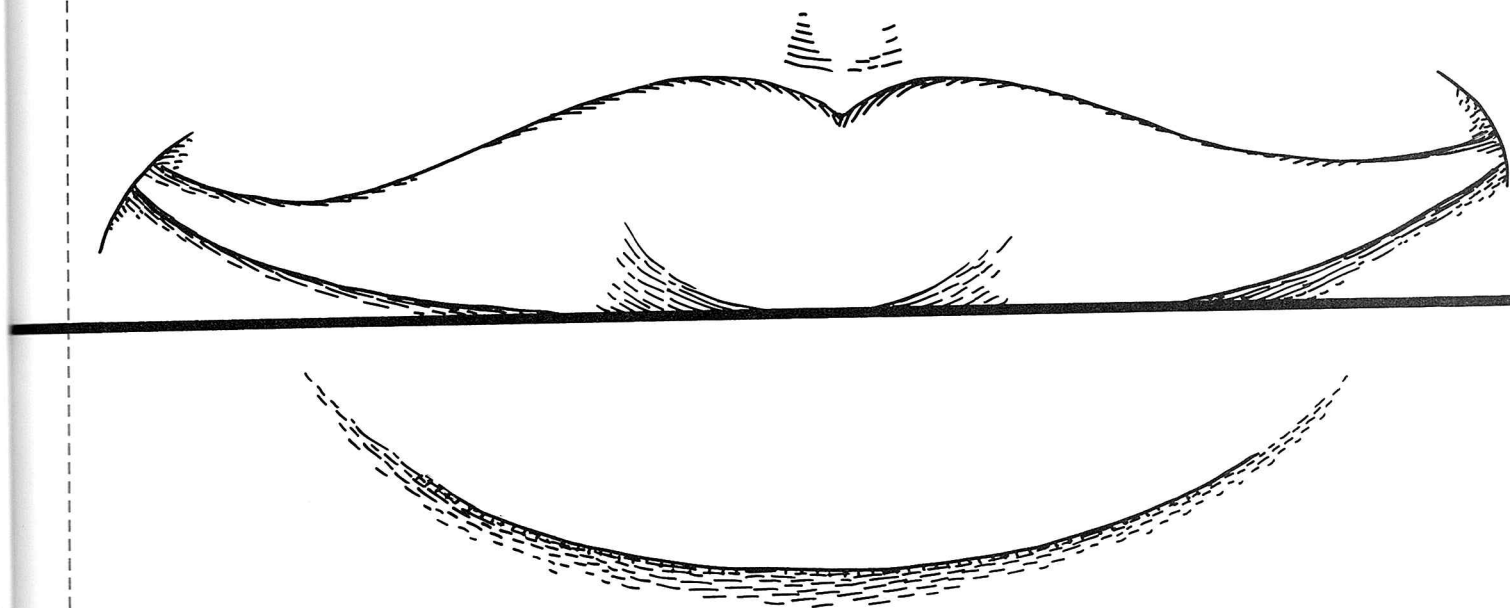
**SALTY**

**SALTY**

**SWEET**

TAPE

TAPE



TAPE

TAPE