Chapter 3
Sensory Evaluation: The Human Factor

Sensory Evaluation Cryptogram

Name ______________________ **Date** __________ **Period** __________

A cryptogram is a coded message. Use the definitions on the right to help you break the code for terms from the chapter. Then use the code you uncover to decipher the cryptogram about sensory evaluation on the next page. An asterisk (*) in the cryptogram represents a *D*, *K*, or *W*.

	Code	Definition
1.	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ U N M U C L P N D X H S X Q T C M	The human analysis of the taste, smell, sound, feel, and appearance of food.
2.	_ _ _ _ _ _ _ I S H Q S L N	The beliefs and behaviors followed by a group of people and passed on from one generation to another.
3.	_ _ _ _ _ _ _ _ D C H X Q T H N	The property of evaporating quickly.
4.	_ _ _ _ _ _ _ _ _ _ _ _ _ C H E X I Q C L P G S H G	A bundle of nerve fibers located at the base of the brain behind the bridge of the nose.
5.	_ _ _ _ _ _ I V L C B X	The intensity of a color.
6.	_ _ _ _ _ _ _ Q N W Q S L N	The way a product feels to the fingers, tongue, teeth, and palate.
7.	_ _ _ _ _ _ _ _ _ _ _ I C M U T U Q N M I P	The thinness or thickness of a food product, which can be measured in terms of pourability.
8.	_ _ _ _ _ _ _ _ _ _ _ I C H C L T B N Q N L	A device that measures the color of foods in terms of value, hue, and chroma.
9.	_ _ _ _ _ _ E H X D C L	The combined effect of taste and aroma.
10.	_ _ _ _ _ _ _ _ _ _ _ _ _ _ Q X U Q N Q N U Q J X M N H	A group of people who evaluate the flavor, texture, appearance, and aroma of food products.
11.	_ _ _ _ _ X L C B X	Odor.

(Continued)

12. __ __ __ __ __ __ __ __ __ __
X J J N X L X M I N

The shape, size, color, and condition of a product.

13. __ __ __ __ __ __ __ __ __
Q X U Q N G T X U

A tendency to like or dislike a food based on positive or negative experiences, respectively.

14. __ __ __ __ __ __ __ __ __ __ __
X U Q L T M O N M I P

The ability of a substance to draw up the muscles of the mouth.

15. __ __ __ __ __ __ __ __ __ __ __
G L T Q Q H N M N U U

How easily a food shatters or breaks apart.

16. __ __ __ __ __ __ __ __ __ __
O L X T M T M N U U

The size of particles in a food product.

17. __ __ __ __ __ __ __ __ __ __ __
I C M U T U Q N M I P

The thinness or thickness of a product.

X H * X P U   U T J   * X L B   * X Q N L   C L   Q X * N   X

G T Q N   C E   I L X I * N L   G N Q * N N M   Q X U Q T M O

* T E E N L N M Q   E C C *   U X B J H N U

Sensory Preferences

Name_____ **Date** _____ **Period**_____

This worksheet will help you analyze factors that have affected your food preferences. First, complete the second and third columns in the chart below by listing your most and least favorite variety for each food category. Next, interview your parent or guardian about his or her food preferences. Complete the fourth and fifth columns in the chart by listing his or her most and least favorite variety for each food category. Finally, answer the questions that follow the chart.

Food Category	My Most Favorite	My Least Favorite	Parent's or Guardian's Most Favorite	Parent's or Guardian's Least Favorite
Beverage				
Breakfast cereal				
Cake				
Candy				
Cookie				
Cuisine				
Fruit				
Ice cream				
Meat				
Pie				
Sandwich				
Snack food				
Soft drink				
Vegetable				

(Continued)

1. Describe a negative experience you remembered about one of the foods you listed as a least favorite._____

   _____

   _____

   _____

   _____

2. Describe a negative experience your parent or guardian remembered about one of the foods he or she listed as a least favorite. _____

   _____

   _____

   _____

   _____

3. Which of the least favorite foods listed would you not be willing to eat as an ingredient in a combination dish, such as a casserole or soup? _____

   _____

   _____

4. Which of the least favorite foods listed in question 3 would you not be willing to eat even if it were prepared in a new and interesting way? _____

   _____

   _____

5. What similarities and differences did you discover between your most and least favorites and those of your parent or guardian? _____

   _____

   _____

   _____

   _____

6. In what ways do you think your family affects your food preferences? _____

   _____

   _____

   _____

   _____

Experiment 3A

Odor Recognition

Lab Group Partners: _____

Date _____ **Period**_____

Safety

- Do not taste samples.
- Do not smell samples directly when identifying aromas. Some foods are lightweight powders, which could easily be inhaled. Instead, wave your hand over the top of the container to direct the aroma toward your nose.
- Do not move around when blindfolded.

Purpose

You usually use a combination of senses to identify foods. In this experiment, you will look at the role your sense of smell plays in evaluating food products. You will examine how accurately you can identify foods by only their aromas.

Equipment

blindfold

Supplies

a shoebox containing coded food samples in portion cups with lids

Procedure

Choose a lab partner or work with the partner your teacher assigns you. Determine which of you will identify aromas first and which will record the data. The partner who is recording the data will follow the steps of the procedure.

1. Blindfold the partner who will be identifying aromas.
2. Open the shoebox and remove one container. Open the lid and hold the container in front of your partner.
3. Have your partner wave his or her hand over the container to direct the aroma toward his or her nose. Ask your partner to identify the aroma he or she is smelling.
4. Record your partner's answer in a data table next to the appropriate code number. Do not name code numbers or give any indication as to whether your partner's answer is correct. Close the container and set it aside.
5. Repeat steps 2 through 4 until all samples have been tested.
6. Return all samples to the shoebox and exchange places with your partner.
7. Repeat steps 1 through 5.

Pre-Lab

Purpose: _____

_____

Procedure Summary: _____

_____

(Continued)

Lab

Data

Have your partner record your responses here. Fill in the Identified Correctly column when your teacher reads the answer key.

Code #	Response	Identified Correctly
186		
341		
517		
649		
235		
492		
758		
923		
467		
803		
312		
708		

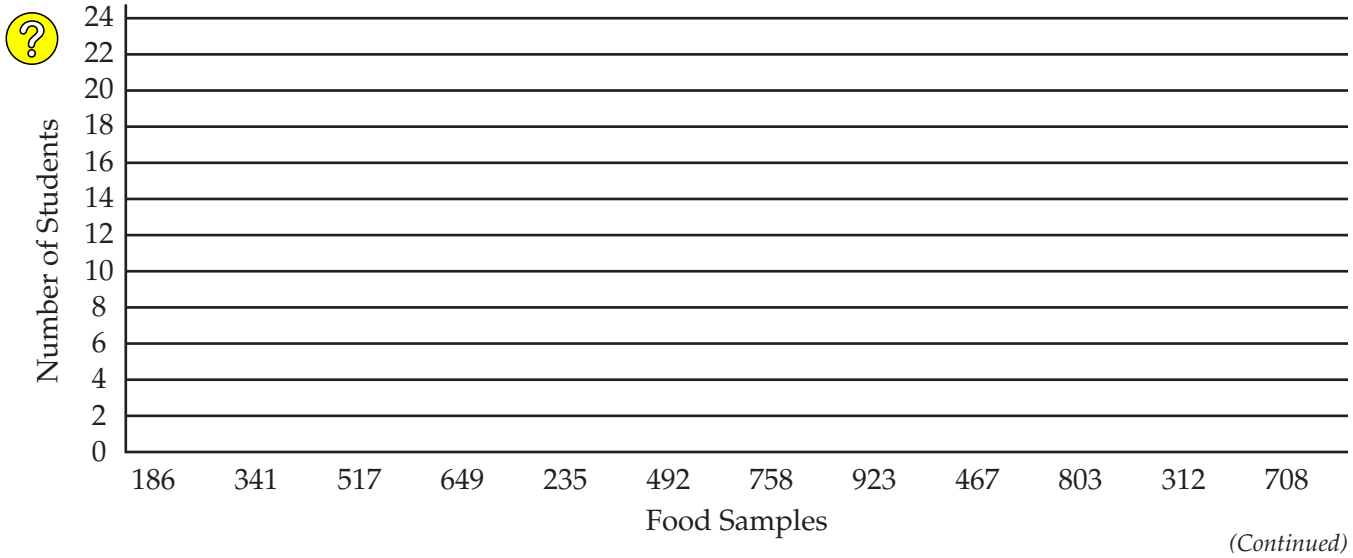
Post-Lab

Class Data

When all students have completed the lab, your teacher will read the key. Check to see how many aromas you correctly identified. Compile your responses with those of your classmates into a class data table. This table should show how many students in each test group correctly identified each sample. Compare your correct answers with those of your classmates.

Calculations

Use the information in the class data table to prepare a bar graph. This graph should compare the correct responses in each test group and the total correct responses for each sample.



(Continued)

Name _____

Questions

1. Which aromas gave you the most difficulty? _____

   _____

   _____

   Which aromas gave your classmates the most difficulty?_____

   _____

   _____

2. Which food was most often identified correctly? _____

   _____

3. Why did some students have more difficulty than other students with this task? _____

   _____

   _____

4. Were the responses of the second member of each pair more or less accurate? _____
   Why? _____

   _____

   _____

5. Is taste or aroma more important in food identification? Explain your answer._____

   _____

   _____

   _____

Experiment 3B

Taste Test Panel

Lab Group Partners: _____

Date _____ **Period**_____

Safety

- Wash hands before handling food.
- Dispose of leftover food in proper garbage containers.
- Clean all surfaces and equipment with hot soapy water.

Purpose

Food preferences are based on experience, flavor, advertisements, peer pressure, culture, and habits. One goal of setting up a taste test is to prevent all these factors from affecting food choices of test panel members. After conducting taste tests, food scientists must determine how to overcome factors that may interfere with the sales of new products. In this lab, you will practice evaluating food samples.

Supplies

napkin
paper plate
3 numbered samples of soft drinks
3 numbered samples of crackers
3 numbered samples of chocolate chips
glass of lukewarm water

Procedure

1. Without any discussion with classmates, circulate through the tasting stations set up by your teacher or select one serving of each item as it is brought to you.
2. Take a small bite of a food sample and chew it for at least 20 seconds or take a small swallow of a drink sample and swirl it in your mouth for at least 20 seconds.
3. Evaluate the aroma, color, texture (or carbonation for soft drinks), and flavor of samples. Record your evaluations in the data table, using a ranking of 1 (worst) to 5 (best) for each characteristic. Also note any specific observations for each characteristic.
4. Take a small swallow of warm water to clear flavor compounds from your mouth.
5. Repeat steps 2 through 4 until you have tasted all samples. Make sure you taste all samples in each category before trying samples in another category. In other words, sample all the crackers before tasting any soft drinks.

Pre-Lab

Purpose: _____

_____

Procedure: _____

_____

(Continued)

Lab

Data

Soft Drinks	834	291	657	Observations
Aroma				
Color				
Carbonation				
Flavor				
Total				

Cracker	308	582	913	Observations
Aroma				
Color				
Texture				
Flavor				
Total				

Chocolate Chips	476	194	706	Observations
Aroma				
Color				
Texture				
Flavor				
Total				

Post-Lab

Class Data

Record your totals on a class data table.

Calculations

Use information from the class data table to calculate which soft drink, cracker, or chocolate chip was the class favorite. Your teacher will reveal the identities of the foods after all calculations are complete.

Questions

1. Did you prefer any food or drink brands other than those you usually purchase? _____
2. Were there clear class favorites in each sample category?_____
3. Why are there so many brands of the same types of foods available? _____

   _____
4. What variables may have influenced the results?_____

   How could you control these variables in future taste testing situations? _____

   _____

   _____

Experiment 3C

Imitation Apple Pie

Lab Group Partners: _____

Date _____ **Period**_____

Safety

- Wash hands before handling food.
- Cut apples on a cutting board.
- Use hot pads to remove pies from the oven.
- Clean all work surfaces and utensils with hot soapy water.

Purpose

Human senses are limited and easily fooled. Chemists can create an imitation food product that looks and tastes like the real thing. The first frozen lemon pies contained neither lemon nor eggs. In this experiment, you will compare the taste of a real apple pie to the taste of an imitation apple pie. For this lab, your teacher will divide the class into four groups. Group 1 will make a real apple pie. Group 2 will make an imitation apple pie. Group 3 will make a crumb topping for the real apple pie. Group 4 will make a crumb topping for the imitation apple pie. Choose the equipment and supplies and follow the procedure for the product your group is assigned to make.

Equipment

Real Apple Pie

paring knife
cutting board
metric dry measuring cups
metric measuring spoons
2-quart saucepan
mixing spoon
pie pan

Imitation Apple Pie

metric liquid measuring cup
2-quart saucepan
metric dry measuring cups
metric measuring spoons
mixing spoon
pie pan

Crumb Topping

metric dry measuring cups
metric measuring spoons
mixing bowl
fork or pastry blender

Supplies

Real Apple Pie

7 to 8 medium golden delicious apples
125 mL flour
250 mL sugar
5 mL cinnamon
1 mL nutmeg
123 mL water
pastry for one-crust pie
30 mL margarine

Imitation Apple Pie

500 mL water
375 mL sugar
7 mL cream of tartar
36 round snack crackers
pastry for one-crust pie
5 mL cinnamon
1 mL nutmeg
30 mL margarine

Crumb Topping

125 mL flour
125 mL brown sugar
2 mL cinnamon
45 mL margarine

(Continued)

Procedure

Real Apple Pie

1. Peel, core, and slice 7 to 8 medium golden delicious apples.
2. Combine flour, brown sugar, cinnamon, and nutmeg in a saucepan.
3. Stir in water.
4. Add the apples. Cook, stirring gently until the apple mixture comes to a boil.
5. Pour apple mixture into a pastry-lined pie pan.
6. Dot with slices of margarine.
7. Cover with the crumb topping.
8. Bake at 400°F for 10 minutes. Then reduce heat to 350°F and bake for an additional 20 minutes or until the filling is bubbly.

Imitation Apple Pie

1. Heat water to the boiling point in a 2-quart saucepan.
2. Mix sugar with cream of tartar.
3. Add this mixture to the boiling water. Turn heat down to low.
4. Add round snack crackers to the mixture, one at a time.
5. Simmer gently for 3 minutes but do not stir.
6. Pour this mixture into a pastry-lined pie pan.
7. Sprinkle with cinnamon and nutmeg.
8. Dot lightly with slices of margarine.
9. Cover with the crumb topping.
10. Bake at 400°F for 30 minutes, or until the filling is bubbly.

Crumb Topping

1. Use a fork or pastry blender to combine flour, brown sugar, and cinnamon in a mixing bowl.
2. Cut in margarine. Mixture should resemble coarse crumbs.
3. Sprinkle evenly over the top of the pie filling.

Pre-Lab

Purpose: _____

_____

Procedure: _____

_____

_____

(Continued)

Name _____

Lab

Data

Carefully examine a sample of each pie. Record your observations of the color, aroma, texture, and flavor in the data table.

Observations	Real Apple Pie	Imitation Apple Pie
Flavor		
Texture		
Aroma		
Color		

Post-Lab

Calculations

1. Convert the metric measurements in this experiment to English using the following equivalents: 250 mL = 1 cup; 5 mL = 1 teaspoon.

2. Convert the English temperature measurements in this experiment to Celsius degrees using the following equation: °C = (°F – 32).

Questions

1. How did the two pies compare in terms of color, aroma, and texture?_____
   _____
   _____
2. What flavors did you detect in the imitation apple pie? _____
   _____
3. List some examples of food products that contain artificial flavors and texturizers. _____
   _____
   _____