

Science
Lessons
K-4

Investigate! Energy Makes a Body Go

Standards References

SCIENCE GLEs

Grade 2 & 3: 5

Grade 5: 10

HEALTH Benchmarks

1-E-2

3-E-1

3-E-2

Materials

At least 10 different types of wind-up toys or pull-back toys that perform in different ways (flip, roll, etc.) Fast food outlets and students are excellent sources for the toys.

Activity Overview

This activity is designed to capture participants' interest by having them investigate how they must add energy to wind up toys to make them work. They compare these toys to their bodies' need for energy received from food, with a particular focus on eating breakfast.

Key Concepts

- Breakfast literally “breaks the fast” and provides the necessary nutrients for the body to function at its highest capacity.
- Skipping breakfast encourages weight gain, lowers metabolism rates, and leaves the body at risk of taking in all the necessary nutrients it needs.
- Students who do not eat breakfast tend to under-perform in school.
- Not eating breakfast is like a wind-up toy that doesn't have fuel to make it go.

Procedure

Preparation: Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the Explore Station with the materials. The food display, *Smoothies for Breakfast or Snacks*, described in the Appendix would enhance this activity.

1. You are going to investigate the movement of toys at your station!
2. Choose a toy, wind it up and watch what happens!
3. How did it move? Why did it move?
4. Discuss with your family what you needed to do to make the toy move.
5. Test the movement of each of the toys.
6. Compare the toys' need for energy to make them move to your body's need for fuel.
7. Read and discuss your Key Concepts! What did you find out about the importance of breakfast?
8. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under “Key Concepts” and discuss how the body is like a toy that needs energy to make it go.

 Investigate! Energy Makes a Body Go
LAB INSTRUCTIONS

1. You are going to investigate the movement of toys at your station!
2. Choose a toy, wind it up and watch what happens!
3. How did it move? Why did it move?
4. Discuss with your family what you needed to do to make the toy move.
5. Test the movement of each of the toys.
6. Compare the toys' need for energy to make them move to your body's need for fuel to make it move.

Read and discuss your Key Concepts!

What did you find out about the
importance of breakfast?

Be sure to write what you have learned and stamp your
Passport to Good Health!

Investigate! Energy Makes a Body Go

Have you ever thought about how long your body goes without food overnight while you are sleeping? You may be going as long as 12 hours without eating! You have been fasting for a long time. Breakfast means to “break the fast.”

When you get up in the morning, your body needs fuel just like your car needs fuel to win the race! Winding the toy provided fuel for your car and food provides fuel for your body.

People who do not eat breakfast tend to:

- Not do as well as they could in school and at work.
- Eat less foods with calcium than they need.
- Eat more calories during the day.
- Have slower metabolism rates which causes weight gain by storing calories in fat cells to conserve them rather than in muscle cells.

Eating a balanced breakfast gives your brain and muscles the fuel they need to function. It improves your mind, energy level, disposition and helps promote weight control. The amino acids, dopamine and serotonin in food help relay messages to the brain and keep you alert, calm and focused.

Foods eaten at breakfast do not have to be traditional items. Pizza, nutritious sandwiches and other foods that you like can be just as good for you! Drinking milk with your breakfast will help you get all of the fuel you need to make each day a winner!

Investigate! FAST FOOD—Eating on the Run!

Standards References

SCIENCE GLEs

Grade 2: 32

Grade 3: 42

Grade 4: 44

Grade 7: 12

HEALTH Benchmarks

1-E-2

3-E-2

1-M-2

Materials

1. Copies of the nutritive content of food items from various restaurants. Sometimes these are available at the restaurants, but are almost always available through the restaurants' Web sites.

Activity Overview

Participants examine some of the current available choices at fast food restaurants to determine which are more healthy and beneficial to the body.

Key Concepts

- Foods available at fast food restaurants often contain high amounts of sodium, saturated fats, and calories.
- Most restaurants have some healthy choices, and comparing what's available at each restaurant helps the consumer make better choices on the run.

Procedure

Preparation: Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the Explore Station along with the materials.

1. If you had the choice to eat at any restaurant in your area, which one would it be? What would you order? Have you ever thought about the nutrition in your favorite fast food? Investigate! Find out what kind of fuel your body is getting when you eat out at your favorite restaurant!
2. Choose three menu items from your favorite restaurant(s). Predict if they are high in sodium, fat or calories.
3. Locate your food items on the menus and compare how they measure up in the amount of fats, sodium and calories. Discuss with your family what you found out.
4. Are there any food choices on the menus that are healthy? What are some of the nutritional factors that should be considered? What are the pros and cons of choosing these "healthier" items? (healthier but more expensive, taste is lacking, no one will eat them, etc.)
5. Which items are the healthiest? Would you be willing to try some of those items the next time you eat out?
6. Read and discuss your Key Concepts! What did you find out about the nutrition content of your favorite fast food?
7. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under "Key Concepts" and discuss the value of investigating issues and sources to make decisions that are based on available data.

 Investigate! FAST FOOD—Eating on the Run
LAB INSTRUCTIONS

1. If you had the choice to eat at any restaurant, which one would it be? What would you order? Have you ever thought about the nutrition in your favorite fast food? Investigate! Find out what kind of fuel your body is getting when you eat out at your favorite restaurant!
2. Choose three menu items from your favorite restaurant(s). Predict if they are high in sodium, fat or calories.
3. Locate your food items on the menus and compare how they measure up in the amount of fats, sodium and calories. Discuss with your family what you found out.
4. Are there any food choices on the menus that are healthy? What are some of the nutritional factors that should be considered? What are the pros and cons of choosing these “healthier” items?
5. Which items are the healthiest? Would you be willing to try some of those items the next time you eat out?

Read and discuss your Key Concepts!

What did you find out about the nutrition content of your favorite fast food?

Be sure to write what you have learned and stamp your
Passport to Good Health!

Investigate! FAST FOOD—Eating on the Run

We all have to eat on the run sometimes, which means eating out or picking up fast food. Only 60% of the meals eaten by Americans are cooked at home!

Were the menu choices healthy ones? Did some of your meals take all of the recommended calories, sodium and fat for the entire day and more? What happens when you “super-size” your meal? There is a trend to offer healthier items, but there aren’t many available yet at most of our favorite restaurants!

VARIETY is the KEY! Eat different types of foods from all of the food groups! Eating many different foods and averaging what you have eaten over a week’s time will help you get all of the nutrition your body needs to stay healthy! You can eat your hamburger, but make sure you have your skim milk, fruit and veggies too! Here are a few tips from *MyPyramid* (www.mypyramid.gov).

THINK: fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products; lean meats, poultry, fish, beans, eggs, and nuts; and foods low in saturated fats, *trans* fats, cholesterol, salt (sodium), and added sugars.

- Make half your grains whole: instead of eating white—eat brown! Brown rice, whole-wheat bread, and whole-wheat flour in pancakes and muffins! [5-7 ounces suggested for most people each day]
- Eat at least 5 servings a day of different types of fruits and vegetables—raw is best with the peel on, as most of the nutrients are just under the skin. [2-3 cups a day suggested for most people each day]
- Choose calcium-rich foods for strong bodies! Milk, cheese, yogurt, canned fish, some dried beans and leafy green vegetables are good sources of calcium. [3 cups suggested for most people each day]
- Go lean with protein—meat should be lean, with most of the fat removed. Other good sources of protein are nuts, fish (salmon, trout and herring are best!), dry beans and dry peas. [5-7 ounces per day suggested for most people each day]
- Balance eating with physical activity! Adults need at least 30 minutes each day of vigorous activity, while children and teenagers need an hour!

Do we have to give up our favorite fast food? No, we just need to have it only be a part of our diet—not food we eat every day!

Investigate! Is it a Fruit or a Vegetable?

Standards References

SCIENCE GLEs

Grade K: 26

Grade 2: 28

Grade 3: 36

HEALTH Benchmarks

1-E-2

3-E-1

Materials

IMPORTANT: This activity requires that several decks of fruit and vegetable cards be printed in color on heavy paper or card stock using the card game template for this activity. There is a picture of a fruit or vegetable on one side. Using the answer key provided, write on the back of each card the corresponding name of the food item and whether it is a fruit or a vegetable.

1. One deck of 30 cards per family each placed in a ziplock bag

Activity Overview

Participants will categorize foods as fruits or vegetables. They will also explore the various parts of the fruit and vegetable that are eaten and why it is recommended to eat five servings daily.

Key Concepts

- Many foods commonly referred to as vegetables are actually fruits.
- The parts of a fruit or vegetable that are eaten may be a flower, stem, roots, seeds, etc.
- Eating five servings of a variety of fruits and vegetables daily is recommended to ensure consumption of necessary nutrients found in these foods.

Procedure

Preparation: Have students prepare the fruit and vegetable cards prior to the Family Nutrition presentation. Print the Key Concepts on heavy cardstock and place at the Explore Station with the materials.

1. You will be sorting a deck of cards into categories of fruits and vegetables. You will also be taking an inventory of the number of fruit and vegetable servings you have eaten in the past three days.
2. Select a deck of cards from your station.
3. Each card has a picture on one side and the answer on the opposite side.
4. Sort the cards into two piles. Put fruits in one pile and vegetables in another.
5. Check your work! Turn over each card to see if you were correct. What did you find out? Were there any surprises?
6. Take an inventory of each family member's diet for the last three days. Did everyone eat at least five servings of fruits and vegetables every day? Was there a variety in your diets?
7. Place the deck of cards back in the plastic bag at your station.
8. Read and discuss your Key Concepts!
9. What did you find out about fruits and vegetables?
10. Be sure to record what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under "Key Concepts" and discuss how important it is to eat a wide variety of fruits and vegetables. An added bonus would be a tasting station with a variety of fruits and vegetables available for taste tests.

 Investigate! Is it a Fruit or a Vegetable?
LAB INSTRUCTIONS

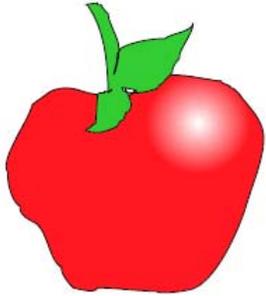
1. You will be sorting a deck of cards into categories of fruits and vegetables. You will also be taking an inventory of the number of fruit and vegetable servings you have eaten in the past three days.
2. Select a deck of cards from your station.
3. The cards have pictures on one side and the answers on the opposite side.
4. Sort the cards into two piles. Put fruits in one pile and vegetables in another.
5. Check your work! Turn over each card to see if you were correct. What did you find out? Were there any surprises?
6. Take an inventory of each family member's diet for the last three days. Did everyone eat at least five servings of fruits and vegetables every day? Was there a variety of fruits and vegetables in your diets?
7. Place the deck of cards back into the plastic bag at your station.

Read and discuss your Key Concepts!

What did you find out about fruits and vegetables and their importance to your health?

Be sure to record what you have learned and stamp your *Passport to Good Health!*

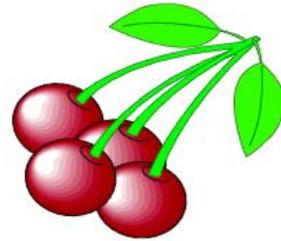
Investigate! Is it a Fruit or a Vegetable?



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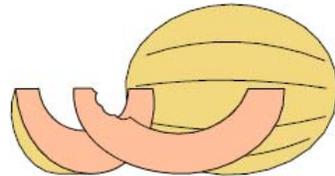
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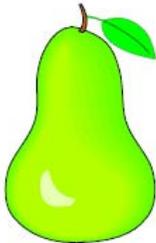
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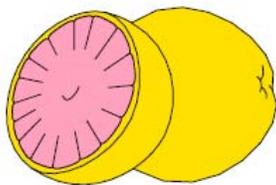
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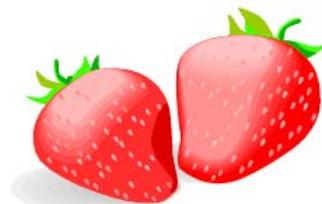
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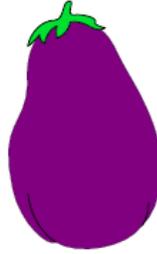


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Investigate! Is it a Fruit or a Vegetable?



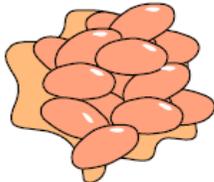
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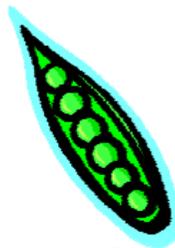
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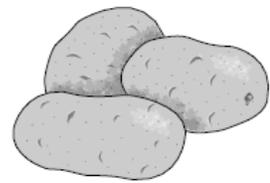
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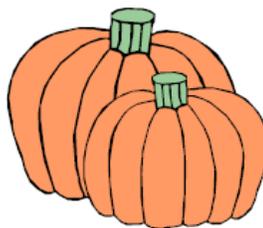
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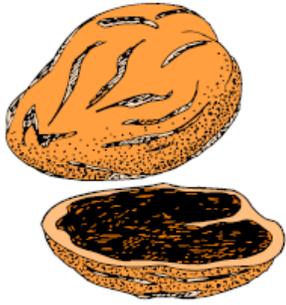


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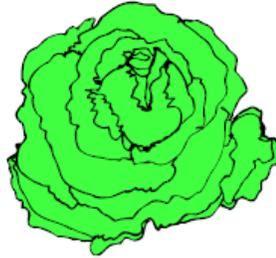


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Investigate! Is it a Fruit or a Vegetable?



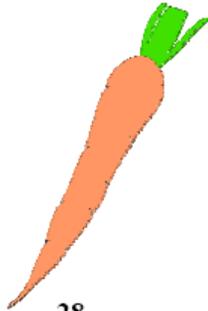
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 Investigate! Is it a Fruit or a Vegetable?
ANSWER KEY

1 Apple Fruit	2 Broccoli Vegetable <i>Flower</i>	3 Cherries Fruit	4 Apricots Fruit	5 Banana Fruit
6 Cantaloupe Fruit	7 Pear Fruit	8 Pineapple Fruit	9 Coconut Fruit	10 Lemon Fruit
11 Radish Vegetable <i>Root</i>	12 Strawberries Fruit	13 Avocado Fruit	14 Eggplant Fruit	15 Corn Vegetable
16 Beans Vegetable <i>Seeds</i>	17 Peas Vegetable <i>Seeds</i>	18 Potatoes Vegetable <i>Tubers</i>	19 Watermelon Fruit	20 Artichoke Vegetable <i>Flower</i>
21 Cucumbers Fruit	22 Tomato Fruit	23 Pumpkin Fruit	24 Asparagus Vegetable <i>Stems</i>	25 Walnut Fruit <i>Nut</i>
26 Lettuce Vegetable <i>Leaves</i>	27 Bell Pepper Fruit	28 Carrot Vegetable <i>Root</i>	29 Green Onion Vegetable <i>Leaves</i>	30 Peanut Fruit <i>Nut</i>

Investigate! Is it a Fruit or a Vegetable?

Did you find out that some of the foods you thought were vegetables were really fruits? What about the tomato and nuts? We usually think of a tomato as being a vegetable, when it is actually a fruit! What about nuts? They seem so different, yet they are also fruits. A fruit is actually the sweet, ripened ovary or ovaries of a seed-bearing plant. A vegetable is a plant with soft stems and little woody tissue that is cultivated for an edible part (seeds, roots, stems, leaves, bulbs, or tubers).

Fruits and vegetables are alike in that they give us the vitamins and minerals we need to keep us healthy. The USDA recommends that we eat at least five servings of fruits and vegetables every day. Why are they so good for us?

According to the USDA, people who eat more fruits and vegetables as part of their diet are less likely to have high blood pressure or develop type 2 diabetes, cancer, strokes, heart disease and many other illnesses.

Fruits and vegetables tend to have fewer calories when compared to other foods, but are good sources of dietary fiber, potassium, folic acid and vitamins A, E and C. With the exception of nuts, they are naturally low in fat and calories. Nuts and beans can fit in the meat group because they contain lots of protein.

- Dietary fiber helps reduce blood cholesterol levels and may lower the risk of heart disease. It also helps with digestion and prevents colon cancer. There is an added bonus. Fiber makes you feel full, which helps keep you from overeating.
- Potassium helps regulate blood pressure.
- Folic acid helps the body form red blood cells. It is important that women have folic acid in their diets when they are pregnant as it prevents some birth defects.
- Vitamin A keeps your eyes and skin healthy and helps protect you from infections.
- Vitamin E helps prevent cell oxidation which may cause aging and diseases.
- Vitamin C helps heal cuts and wounds and keeps your teeth and gums healthy. It also aids in iron absorption.

As you can see, eating fruits and vegetables is important to keeping you healthy. The key is eating a variety of different types so that you are sure to eat all the necessary vitamins. So, remember, eat at least 5 servings every day—the fresher the better! It is much better to eat an orange than to drink a glass of orange juice. Also, look for different colors. Eating a rainbow of colors is best for your body and will help make sure you get everything your body needs.

Investigate! Mapping Your Tastes

Standards References

SCIENCE GLEs

Grade K: 11

Grade 1: 5

Grade 2: 6

Grade 3: 6

Grade 4: 7

Grade 7: 2

HEALTH Benchmarks

1-E-1

Materials

1. Prepare 3 solutions for tasting and store in covered containers. Label Numbers 1-3: Solution #1: 100% bottled lemon juice; Solution #2: mix 3 tablespoons of sugar into each 8oz of water needed. Solution #3: mix 3 tablespoons salt into each 8 oz of water needed. Each family will only need a tablespoon of each solution.
2. Several gallons of bottled water.
3. Small paper bathroom cups. 3 per family for each solution, 1 per person for water
4. One 25mL graduated cylinder for measuring each solution, clearly labeled with its corresponding number
5. Thin paper plate for the lab
6. Cotton swabs. 3 per person (include a few extra at the station in case they are needed)
7. Diagram of Mapping Your Tongue for Tasting
8. Trash Can

Activity Overview

Participants use a tongue mapping exercise to taste sweet, salty and sour water and discover that different parts of the tongue will generally recognize different tastes.

Key Concepts

- Taste buds are located on the tongue, and while many subtle tastes are recognized, there are five distinct groups—salty, sweet, sour, bitter and a newly discovered taste, umami.
- Each taste bud contains 50-100 taste cells, and each taste cell has receptors. While receptors are capable of recognizing all tastes, some tend to recognize sour foods and are usually located around the sides of the tongue. Sweet and salty foods are usually tasted best on or near the end of the tongue. Bitter foods are usually tasted at the back of the tongue. The middle of the tongue generally has no taste buds.

Procedure

Preparation: Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the Explore Station with the materials. Print and cut the student activity sheets, placing them at the station. Post the diagram of the tongue at the station.

1. You are going to explore your sense of taste in this activity. Your partner will touch three different parts of your tongue with three different solutions. Your job is to discover which part of your tongue tastes the different solutions. All of the solutions are made from common substances and are safe to eat and drink.
2. Fill a cup with water to sip in between testing the solutions.
3. Measure 10 mL of Solution #1 into a paper cup. Make sure you measure over your lab! Your family will use this cup for each person to explore the sense of taste. Dip only clean cotton swabs in this cup.
4. Distribute three cotton swabs to each family member.
5. Have a partner dip one of your cotton swabs into Solution #1 and place it on one side of your tongue. Can you taste it?
6. Take a sip of water, and have your partner touch the end of your tongue with the cotton swab. Are you able to taste it now?
7. Take a sip of water, and have your partner touch the middle of your tongue with the cotton swab. What do you taste?
8. Record whether you can taste the solution and if it is salty, sour or sweet and where you tasted it.
9. Follow the same procedure for Solutions #2 and #3. Be sure to record your findings! Are they the same for every member?
10. Read and discuss your Key Concepts! What did you find out?
11. Write down what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under “Key Concepts” and discuss how the tongue recognizes different tastes and how important the sense of taste is when making food selections. Create a display on Hidden Sodium as described in the Appendix.

Investigate! Mapping Your Tastes

LAB INSTRUCTIONS

1. You are going to explore your sense of taste in this activity. Your partner will touch three different parts of your tongue with three different solutions. Your job is to discover which part of your tongue tastes the different solutions. All of the solutions are made from common substances and are safe to eat and drink.
2. Fill a cup with water to sip in between testing the solutions.
3. Measure 10 mL of Solution #1 into a paper cup. Make sure you measure over your lab plate! Your family will use this cup for each person to explore the sense of taste. Dip only clean cotton swabs in this cup.
4. Distribute three cotton swabs to each family member.
5. Have a partner dip one of your cotton swabs into Solution #1 and place it on one side of your tongue. Can you taste it?
6. Take a sip of water, and have your partner touch the end of your tongue with the cotton swab. Are you able to taste it now?
7. Take a sip of water, and have your partner touch the middle of your tongue with the cotton swab. What do you taste?
8. Record whether you can taste the solution and if it is salty, sour or sweet and where you tasted it.
9. Follow the same procedure for Solutions #2 and #3. Be sure to record your findings! Are they the same for every member?

Read and discuss your Key Concepts!

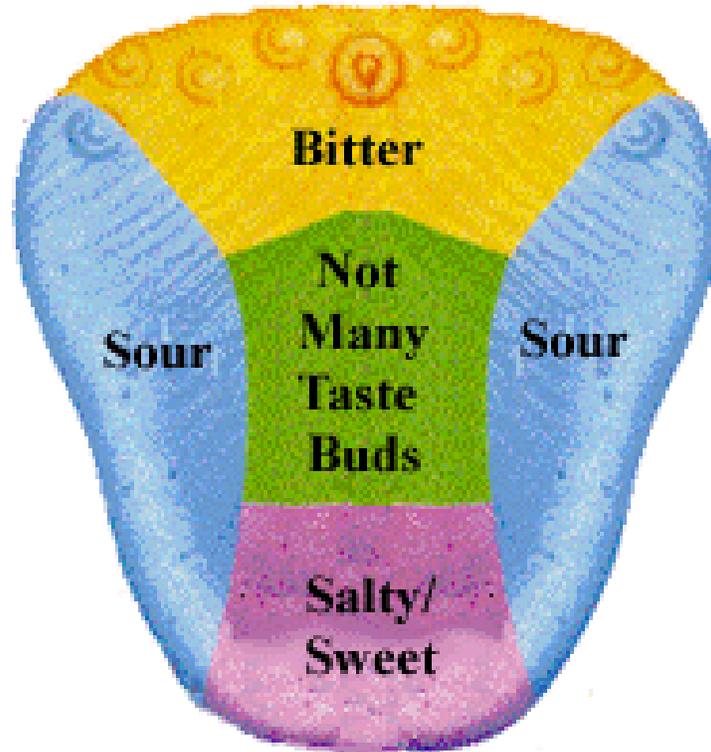
What did you find out about tasting foods?

Visit the display on Hidden Sodium.

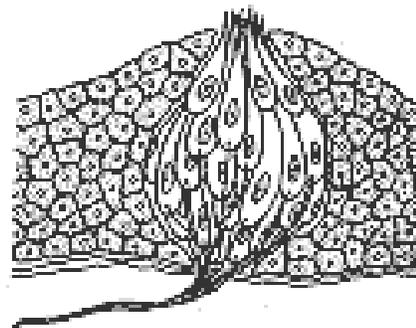
Be sure to write what you have learned and stamp your

Passport to Good Health!

Investigate! Mapping Your Tastes
Mapping Your Tongue for Tasting



An Individual Taste Bud



Investigate! Mapping Your Tastes

Mapping Your Tongue for Tasting Where Do YOU Taste the Different Solutions?

Solution	Side	Middle	End
# 1			
# 2			
# 3			

Did you know?

Insects have the most highly developed sense of taste. They have taste organs on their feet, antennae, and mouthparts!

Fish can taste with their fins and tail as well as their mouths!

Mapping Your Tongue for Tasting Where Do YOU Taste the Different Solutions?

Solution	Sides	Middle	End
# 1			
# 2			
# 3			

Did you know?

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Mapping Your Tongue for Tasting Where Do YOU Taste the Different Solutions?

Solution	Sides	Middle	End
# 1			
# 2			
# 3			

Did you know?

Insects have the most highly developed sense of taste. They have taste organs on their feet, antennae, and mouthparts!

Fish can taste with their fins and tail as well as their mouth!

Investigate! Mapping Your Tastes

Did you know that some of us are better “tasters” than others? Humans can be “average tasters” and have only 184 taste buds per square centimeter of tongue, but “super tasters” can have as many as 425 buds per square centimeter! And those that don’t have a well developed sense of taste have only about 96 taste buds per square centimeter of tongue! Which type of taster are you? Does everyone in your family have the same “tasting ability?”

A taste bud is the actual organ that allows you to taste. On average, there are 10,000 taste buds in the human tongue, and there are between 50-150 receptor cells within each taste bud. Receptor cells live for only one to two weeks and then are replaced by new receptor cells. Each receptor in a taste bud responds best to one of the basic tastes. A receptor can respond to the other tastes, but it responds strongest to a particular taste. Older people tend to lose their acute sense of taste because the receptor cells are not replaced as often as when they were younger.

Different parts of the tongue seem to detect different types of tastes. However, the very center of the tongue does not have taste buds so it cannot taste foods. Were you very good at determining which taste you were experiencing? Check out the graphic where most people experience a particular taste on their tongue. Did your sense of taste match the areas that are shown or were they different?

Receptors are proteins that nestle in the cell's surface and bind specific chemicals sort of like a key fits into a lock. When activated by a chemical, the taste buds trigger nerve impulses that travel to the brain, where taste information is processed. The sense of smell is also activated and also processes the information.

How can a food taste delicious to one person or culture and terrible to another? Genetics! Each person has their own distinctive set of taste receptors that makes them unique in how food tastes to them.

Standards References

SCIENCE GLEs

Grade K: 11

Grade 1: 5

Grade 2: 6

Grade 3: 6

Grade 4: 7

Grade 7: 2

HEALTH

1-E-1

Materials

1. Thin paper plate for the lab
2. Prepare various sweet, salty and sour foods for participants to taste. Be sure to use hard candies in various flavors as these have the same texture and are available to test for sweet and sour. Slice or break up large pieces of foods into small bite-sized pieces suitable for taste-testing, e.g., put standard-sized peppermints in a zip lock baggie and use a hammer to break them into small pieces. Place small baggies of the various foods at each Explore Station and replenish as needed. Small pieces of various types of sweet, salty, sour foods: hard candies such as peppermints, butterscotch rounds, sour apple, etc., salted/unsalted pretzels, sweet and tart apples, etc. Prepare at least two samples of sweet, salty and sour foods for each participant to test.

3. Blindfolds (one per two-person partners)

4. Tweezers (one per two-person partners)

MODIFICATION:

This activity can also be done using various flavors of life savers and only testing for flavor rather than three of the basic tastes.

Investigate! Mystery Tastes

Activity Overview

Participants taste sweet, salty and sour foods and discover that being able to see and smell food are important to the sense of taste.

Key Concepts

- The senses of taste and smell are closely linked.
- Odors can affect how one tastes foods.

Procedure

Preparation: Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the Explore Station with the materials.

1. You are going to explore how the sense of smell affects your sense of taste. One of you will put on a blindfold and hold his nose while tasting and identifying whether a food is sweet, salty or sour, then you will switch roles. NO peeking or smelling during Step One! Your job is to figure out what the food is WITHOUT observing or smelling it!
2. **Step One:** While you are blindfolded and holding your nose, your partner will use the tweezers to place a small piece of food in your hand. Place the food in your mouth. Tell your partner if the food is sweet, salty or sour. Your partner will record your response for each food.
3. **Step Two:** Let go of your nose and tell your partner if the food is sweet, salty or sour. She/he will record your answer.
4. After each food has been tested, switch places with your partner and follow the same procedure just as she/he did with you previously.
5. What did you find out? Did your answers match after both Step One and Step Two or were they different?
6. Read and discuss your Key Concepts! What did you find out? Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under “Key Concepts” and discuss how the sense of smell is important in determining the tastes of various foods.

Investigate! Mystery Tastes

LAB INSTRUCTIONS

1. You are going to explore how the sense of smell affects your sense of taste. One of you will put on a blindfold and hold his nose while tasting and identifying whether a food is sweet, salty or sour, and then you will switch roles. **NO** peeking or smelling during Step One! Your job is to figure out what the food is **WITHOUT** observing or smelling it!
2. **Step One:** While you are blindfolded and holding your nose, your partner will use the tweezers to place a small piece of food in your hand. Place the food in your mouth. Tell your partner if the food is sweet, salty or sour. Your partner will record your response for each food.
3. **Step Two:** Let go of your nose and tell your partner if the food is sweet, salty or sour. She/he will record your answer.
4. After each food has been tested, switch places with your partner and follow the same procedure just as she/he did with you previously.
5. What did you find out? Did your answers match after both Step One and Step Two or were they different?

Read and discuss your Key Concepts!

What did you find out about tasting foods?

Be sure to write what you have learned and stamp your *Passport to Good Health!*

Investigate! Mystery Tastes

Did you know that 80-90% of what you taste is dependent on your sense of smell? A taste bud is the actual organ that lets you taste, but it does not identify taste on its own. It works with your sense of smell.

Have you ever had a cold and couldn't taste your food? That's because you couldn't smell your food! Smell and taste are called chemical senses because they sense chemicals. The senses of smell and taste are connected to each other and inform us about the foods we eat.

If you hold your nose, the scent molecules are unable to travel up to the olfactory organ at the back of the throat and to the nose. Humans can identify a combination of five basic tastes: salty, sweet, sour, bitter and a recently discovered "umami" taste that occurs when glutamate is eaten.

Since we can only recognize five different true "tastes," our sense of smell is the one that lets us experience the complex, enticing flavors of our favorite foods!

Investigate! Safe Sun!

Standards References

SCIENCE GLEs

Grade 4:2
Grade 4:7

HEALTH Benchmarks

1-E-2
1-E-3
3-E-2
3-E-3

Materials

Clearly label all containers

1. UV beads placed in a container. The participants are going to want to take more beads home with them than the required 4 per person. Placing 8 beads (enough for a pair) in separate snack-sized plastic bags may help prevent bead loss.
2. Bright colored plastic twine, cut in 8" lengths for stringing the beads.
3. Sunscreen with SPF of 15, 30 and 45. Prepare the samples by pouring into Petri dishes and labeling the contents. Place them in a line on the table under a label. Write the labels in three different colors so they can be easily matched to their corresponding cotton swabs.
4. 20 cotton swabs for each Petri dish, each with a ring around the middle of the swabs that match its Petri dish. Place the swabs in a plastic bag and label with the matching color SPF.
5. Markers, one per family
6. Stopwatch, one per family
7. Paper towels
8. Full spectrum florescent lamp (purchased from pet shop)

Activity Overview

Participants conduct a series of investigations to determine the effects of UV rays on a UV sensitive bead. They make their own UV indicator bracelets.

Key Concepts

- Only 15 minutes, three times per week, of exposure to the sun is needed to manufacture enough Vitamin D to keep people healthy.
- Any amount of exposure to the sun affects the skin; the American Academy of Dermatology suggests using sunscreen if exposure will be longer than 20 minutes.
- Too much exposure to UV rays damages the skin and can cause cancer.
- Sunscreen applied to the skin decreases the effects of UV rays.

Procedure

Preparation: Print the Key Concepts and Lab Instructions on heavy cardstock and place at the Explore Station with the materials.

1. You are going to test the effects of ultraviolet (UV) rays on a special bead that reacts to the presence of UV rays. The light simulates rays from the sun.
2. Select 4 UV beads from the container and hold them under the light. Discuss what happened to the beads' color with your family.
3. Place the beads in an evenly spaced row on your lab plate. Use the marker to write "None" under the first bead, "SPF 15," under the second bead, "SPF 30" under the third bead and "SPF 45" under the fourth bead.
4. You will use a cotton swab to apply a thin layer of the SPF sunscreen to the top and sides of each bead. The sunscreen is located in the Petri dishes. Be sure to match the SPF sunscreen number with its partner bead, leaving the bead marked "None" without any sunscreen. Keep each cotton swab matched to its SPF sunscreen. Replace swabs as needed and discard any that are not matched by color to its corresponding number sunscreen.
5. Place your lab plate under the light for 30 seconds using a watch or stopwatch. Describe any changes in color that have occurred. Allow the beads to stay under the light for an additional 30 seconds. Is there a difference in color between the bead not covered with sunscreen and those covered in SPF 15 and 45 after one minute of exposure? Discuss your results with your family.
6. Wipe the sunscreen off your beads with a paper towel and string them on the plastic twine to make a bracelet. You may want to bring them outside tomorrow and see how they react when exposed to the sun's rays.
7. Read and discuss your Key Concepts! What did you find out about the effects of UV rays on your skin?
8. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under "Key Concepts" and discuss the effect of UV rays on skin. Visit the food displays and note the dairy and cereal products fortified with Vitamin D.

Investigate! Safe Sun! LAB INSTRUCTIONS

1. You are going to test the effects of ultraviolet (UV) rays on a special bead that reacts to the presence of UV rays. The light simulates rays from the sun.
2. Select 4 UV beads from the container and hold them under the light. Discuss what happened to the beads' color with your family.
3. Place the beads in an evenly spaced row on your  plate. Use the marker to write "None" under the first bead, "SPF 15," under the second bead, "SPF 30" under the third bead and "SPF 45" under the fourth bead.
4. You will use a cotton swab to apply a thin layer of the SPF sunscreen to the top and sides of each bead. The sunscreen is located in the Petri dishes. Be sure to match the SPF sunscreen number with its partner bead, leaving the bead marked "None" without any sunscreen. Keep each cotton swab matched to its SPF sunscreen. Replace swabs as needed and discard any that are not matched by color to its corresponding number sunscreen.
5. Place your lab plate under the light for 30 seconds using a watch or stopwatch. Describe any changes in color that have occurred. Allow the beads to stay under the light for an additional 30 seconds. Is there a difference in color between the bead not covered with sunscreen and those covered in SPF 15 and 45 after one minute of exposure? Discuss your results with your family.
6. Wipe the sunscreen off your beads with a paper towel and string them on the plastic twine to make a bracelet. You may want to take them outside tomorrow and see how they react when exposed to the sun's rays.

Read and discuss your Key Concepts!

What did you find out about the effects of UV rays on your skin?

Be sure to write what you have learned and stamp your

Passport to Good Health!

Investigate: Safe Sun!

HOT TIPS to Enjoy Safe Sun!

- Wear a hat and cover as much skin as you can if you are going to be out in the sun for a long time.
- Use a waterproof sunscreen with a high SPF number if you are going to be in the sun more than 30 minutes.
- Apply sunscreen at least 15 minutes before going out in the sun.
- Be sure to put sunscreen on all parts of your body that will be in the sun. It's easy to skip places!
- Try to stay in the shade as much as possible.
- Wear sunglasses to protect your eyes!

Avoid Skin Cancer! Practice SAFE SUN!

- Skin cancer is the most common cancer in the United States.
- Melanoma is a deadly skin cancer that is caused by UV radiation from the sun or artificial tanning booths.
- Melanoma is linked to excessive sun exposure in the first 18 years of life.
- Avoid sunburns by practicing SAFE SUN!

What about your body's need for vitamin D? Remember you need only 15 minutes of sun three times a week to produce vitamin D. You can also take in vitamin D through vitamin-D fortified foods, salmon, or a multivitamin that has 600-800 units of vitamin D.

Investigate! Safe Sun

Did you know that the sun provides everything we need to live? Without the sun, we would not be able to produce food or stay alive in our world! It would be a cold, dark place without any people, plants or animals! The sun even helps make vitamin D in our bodies! But while the sun is our friend, it is also our enemy!

Did you enjoy watching the beads change color? What made them change? If you think of the beads as your skin, and the light as the sun, it shows what happens every time you go out in the sun. The sun changes your skin, just like the light changes the beads. The more sun your skin gets, the more your skin changes.

Have you ever been sunburned? The sun's rays were so strong, they actually made your skin burn! How did it feel? When you get sunburned when you are under 18 years old, you have a greater chance of developing skin cancer when you get older!

What do you think would help prevent sunburn? Sunscreen! The American Academy of Dermatology recommends that we protect our skin from the sun as much as we can, and even if we are going out for only a half-hour we should use sunscreen. The sun's rays can come through the clouds, so even if it is cloudy, wear your sunscreen.

Sunscreen comes in many different types and strengths. It doesn't matter what type you use, whether it is a spray, gel, cream or lotion. But it does matter what strength of SPF you use! The higher the number, the better protection you will have. Babies and children under the age of 12 should put on sunscreen that has at least an SPF number of 45 to protect their skin from sun damage.

Investigate! What Are Carbohydrates and How Are They Used in the Body?

Standards References

SCIENCE GLEs

Inquiry Elementary: 4, 6

Grade 3: 34, 42

Grade 4: 43

Inquiry Middle: 7, 19

HEALTH Benchmarks

1-E-2

3-E-1

1-M-2

Materials

1. Thin paper plates for labs.
2. Four small testing samples of food placed in plastic bags. Examples: bread, potatoes, cornstarch, crackers, rice, vegetables, fruits, candy, sugar, dried beans, yams, honey, green and ripe bananas. Be sure to choose foods that are light in color so any changes can be easily identified.
3. Eyedroppers or pipettes
4. Iodine solution: Mix water and iodine in at approximately a 50:1 ratio. The solution should be a deep yellow color. Test your solution to make sure it contains sufficient iodine to show evidence of starch. LABEL the solution as POISONOUS!

Place this warning at the Explore Station:
CAUTION! Iodine is poisonous if ingested! KEEP AWAY FROM YOUNG CHILDREN!

Activity Overview

Participants conduct a starch test on various foods to determine carbohydrate content.

Key Concepts

- Carbohydrates are one of the three key components of a balanced diet.
- Carbohydrates are found in many foods, including vegetables and grains and are mainly sugars and starches, together constituting one of the three principal types of nutrients used as energy sources (calories) by the body.
- Carbohydrates can also be defined chemically as neutral compounds of carbon, hydrogen and oxygen.
- Starches are made by plants as a means of storing sugar for energy needs.

Procedure

Preparation: Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the Explore Station. **CAUTION! IODINE IS POISONOUS!** This station should be monitored at all times.

1. You are going to test four different foods for carbohydrate content using an iodine solution that will change the color of the food upon contact if it contains starch. **WARNING: Iodine is poisonous! Keep away from young children, and if you get any on your hands wash them immediately!**
2. Keep all of your materials on your lab plate!
3. Place one sample of food on your lab. What is it? Do you think it contains carbohydrates? Test out your prediction!
4. Using the pipette in the container marked "Iodine Solution," put a drop of the iodine solution on the food sample. If the solution changes the food to a deep blue color, the food contains starch.
5. Test each type of food at your station and record your predictions and results.
6. Are any of the results surprising to you? Do you think that cooking the food would make a difference? Why/why not?
7. Thank you for cleaning up your lab! Please throw away your lab plate and the samples you tested.
8. Read and discuss your Key Concepts! What did you find out about the starch content of various foods?
9. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under "Key Concepts" and discuss carbohydrates and their importance to maintaining a healthy body. Optional: Refer families to tasting activities of cereals and fruits.

 Investigate! What Are Carbohydrates and How Are They
Used in the Body?
LAB INSTRUCTIONS

1. You are going to test four different foods for carbohydrate content using an iodine solution that will change the color of the food upon contact if it contains starch. WARNING: Iodine is poisonous! Keep away from young children, and if you get any on your hands wash them immediately!
2. Keep all of your materials on your lab  plate!
3. Place one sample of food on your lab plate. What is it? Do you think it contains carbohydrates? Test out your prediction!
4. Using the pipette in the container marked “Iodine Solution,” put a drop of the solution on the food sample. If the solution changes the food to a deep blue color, the food contains starch which is a carbohydrate.
5. Test each type of food at your station and record your predictions and results.
6. Are any of the results surprising to you? Do you think that cooking the food would make a difference? Why/why not?
7. Thank you for cleaning up your lab! Please throw away your lab plate and the samples you tested. Wash your hands if there is any iodine on them.

Read and discuss your Key Concepts!

What did you find out about the carbohydrate
content of various foods?

Be sure to write what you have learned and stamp your *Passport to
Good Health!*

Investigate! What Are Carbohydrates and How Are They Used in the Body?

Did you know that before a game or competition, most athletes will eat a large amount of foods rich in carbohydrates? Carbohydrates provide the main source of energy for our bodies. Carbohydrates, as well as fats and proteins, are the three basic nutrients of a balanced diet that are used as energy sources (calories) by the body.

Carbohydrates are essential in a balanced diet. They are composed of carbon, hydrogen and oxygen and are mainly sugars and starches. Carbohydrates are found in many foods, including vegetables and grains.

Most carbohydrates are made by plants. Starches are made by plants as a means of storing sugar for energy needs. Sugars, starch and cellulose are examples of carbohydrates. Sugars are small, simple carbohydrates that usually taste sweet. Glucose, fructose and sucrose are the names of the three simple sugars. Glucose is the most common form of sugar used as energy in our bodies.

Carbohydrates that are found in whole grains (whole wheat bread, rolls, etc.) and fruits and vegetables are better for your body than refined sugar and white flour (white bread, cookies, etc.).

Eating a balanced diet with the recommended amount of carbohydrates as shown on the *My Pyramid Plan* is important to maintaining good health.

Investigate! What Are Fats and How Are They Used in the Body?

Standards References

SCIENCE GLEs

Grade 2: 4, 6

Grade 3: 4, 6, 34, 42

Grade 4: 7, 43

HEALTH Benchmarks

1-E-2

3-E-1

3-E-2

Materials

1. thin paper plates for labs.
2. small one-inch testing samples of various foods placed in plastic bags. Label each bag accord to its contents: potato chips(regular/baked), carrots, apples, various types of nuts, biscuits, etc. It is suggested that there are at least eight different types of fatty/non-fatty foods to test for comparisons. Be sure to include at least one example of regular versus low fat in the same type of food (chips are good examples).
3. three-inch brown paper bag squares (four per family)
4. hairdryer (one per two families)
5. shoebox lined with aluminum foil (one per two families) for drying the samples quickly

Activity Overview

Participants conduct a simple fats test on various foods to determine fat content.

Key Concepts

- Fats are one of the three key nutrients that provide calories.
- Healthy fats include unsaturated fats, (olive and canola oils, nuts, seeds, nut butters, and avocados) and fats that are high in omega 3 fatty acids, (fish oil and flax seeds).
- Adequate fat intake is necessary for healthy skin and hair, hormone production, nervous system function, and other important body functions. They also help in the absorption of fat-soluble Vitamins A, D, E and K.
- Fats provide calories for energy, but contain almost twice the amount of energy per gram when compared to carbohydrates and proteins. When more calories are eaten than are used, the body stores the calories as fat.

Procedure

Preparation: Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the Explore Station with the materials. The food displays regarding fats described in the Appendix would enhance this activity.

1. You will work together with another family to test foods for fat content using brown paper bag squares that will detect the fat in food by leaving a translucent residue. Each family will test four different samples so you will have a total of eight samples to observe.
2. Keep all of your materials on your lab plate.
3. For each of the foods provided, predict whether or not the food will contain fats. Record your prediction.
4. Test your knowledge. Label the squares with the names of the food items.
5. Rub approximately the same amount of food onto each one of the squares until there is a spot.
6. Place your squares side by side in the shoebox and use the hairdryer to dry them. Observe each square. If the spot is greasy and makes the paper translucent, there is fat in the food. If it was only wet, there is little or no fat in the food.
7. Record your findings next to your predictions. How good were you at predicting fats in foods?
8. Read and discuss your Key Concepts! What did you find out about the fat content of various foods and their importance to your body?
9. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under “Key Concepts” and discuss the dietary need for fat and the difference between unsaturated and saturated fats.



Investigate! What Are Fats and How Are They Used in the Body?

LAB INSTRUCTIONS

1. You will work together with another family to test foods for fat content using brown paper bag squares that will detect the fat in food by leaving a translucent residue. Each family will test four different samples, so you will have a total of eight samples to observe.
2. Keep all of your materials on your Lab plate.
3. For each of the foods provided, predict whether or not the food will contain fats. Record your prediction.
4. Test your knowledge. Label the squares with the names of the food items.
5. Rub approximately the same amount of food onto each one of the squares until there is a spot.
6. Place your squares side by side in the shoebox and use the hairdryer to dry them. Observe each square. If the spot is greasy and makes the paper translucent, there is fat in the food. If it was only wet, there is little or no fat in the food.
7. Record your findings next to your predictions. How good were you at predicting fats in foods?
8. Read and discuss your Key Concepts! What did you find out about the fat content of various foods and their importance to your body?

Read and discuss your Key Concepts!

What did you find out about the fat content of food and their importance to your body?

Be sure to write what you have learned and stamp your
Passport to Good Health!

Investigate! What Are Fats and How Are They Used in the Body?

Did you know that fats are one of the three nutrients your body needs to provide calories? Fats, along with carbohydrates and proteins, are the basic components of a balanced diet.

In fact, adequate fat intake is necessary for healthy skin and hair, hormone production, nervous system function, and other important body functions. They also help in the absorption of fat-soluble Vitamins A, D, E and K.

But it is important to limit the amount of fat in your diet. Fat provides 9 calories of energy per gram—almost twice as much as carbohydrates and protein—making it the most concentrated form of energy. When more calories are eaten than used, the body stores the calories as fat.

While a low fat diet is preferable, it is important to make sure that you consume adequate amounts of healthy, unsaturated fats, and limit unhealthy saturated fats. Liquid oils are better for you than solid shortenings.

Unsaturated Fats and Omega 3 Fatty Acids are Healthier for You	LIMIT Saturated Animal and Hydrogenated Fats and Trans-fatty Acids
Olive and canola oils, nuts, seeds, nut butters, soy, avocados and fats that are high in omega 3 fatty acids such as fish oil and flax seed	Fried foods, corn and safflower oils, butter, cream, whole milk, cheese and hydrogenated fats and trans-fatty acids found in most margarines and other processed products, including most protein bars

Investigate! What Are Vitamins and How Is Vitamin C Used in the Body?

Standards References

SCIENCE GLEs

Grade 2: 4, 6

Grade 3: 12, 34

Grade 4: 4, 13

HEALTH Benchmarks

1-E-3; 3-E-1

Materials

Clearly label all containers

1. samples of 4 food juices to test (lemonade, orange juice, cola and juice drink or lemon/lime soda that does not contain vitamin C). Each liquid should be placed in a large-mouth container or beaker and clearly labeled.
2. tincture of iodine
3. bottles of tap water for easy pouring into a cylinder
4. cornstarch solution (2T cornstarch dissolved in 1 quart boiling water) made ahead of time and placed in a large-mouth container or beaker and labeled as such
5. 4 small 3 oz or portion cups per family
6. pipettes or eye droppers—2 per liquid
7. graduated cylinders (at least 50 mL)
8. large trash can lined with plastic bag and marked Discarded Testing Solution
9. paper towels

Place this warning in large print at the Explore Station:
CAUTION! Iodine is poisonous if ingested! **KEEP AWAY FROM YOUNG CHILDREN!** Wash hands thoroughly if iodine is present.

Activity Overview

Participants conduct a Vitamin C test on various foods to determine its presence.

Key Concepts

- Vitamins (about 12 are identified) are compounds that are necessary in very small amounts to maintain good health.
- Vitamins must be included in the diet since the body usually does not produce them on its own.
- Vitamin C is one of the best known vitamins. It cannot be stored in the body, so it must be a part of the daily diet.

Procedure

Preparation: Print the Key Concepts on heavy cardstock and place at the Explore Station. Set up all materials needed at the station. Make sure all containers are clearly labeled as to their contents. All safety precautions must be taken during this activity.

1. You are going to test foods for vitamin C presence by adding food to a solution of cornstarch and iodine.
2. Predict and discuss which foods you believe will contain vitamin C.
3. Test your knowledge! You will be working with various pipettes to measure liquid drops. Be sure to keep each pipette with the liquid it measures and work over your lab plate.
4. Measure 30 mL of water in a graduated cylinder. Pour the water into Cup 1. Fill Cups 2, 3 and 4 each with 30 mL water. Place the water and cylinder back with the materials.
5. Fill the starch solution pipette with the starch solution (made from cornstarch and water) and put 10 drops in each cup of water. Place the pipette back with the solution.
6. Fill the iodine pipette with iodine and add two drops to each cup. (The solution should turn slightly blue.) Place the pipette back with the iodine.
7. Fill the number 1 pipette with its matching food and add three drops to Cup 1. If the blue disappears, the food contains vitamin C. If it does not, the food does not contain vitamin C. Repeat this step for food samples 2, 3 and 4. Be careful to keep each pipette with the food it measures.
8. Compare your predictions with the actual results. What did you find out?
9. Discard your solution in the large container marked **DISCARDED TESTING SOLUTION**. Thank you for cleaning up your area!
10. Read and discuss your Key Concepts! What did you find out about vitamin C and its importance to your body?
11. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under “Key Concepts” and discuss how important vitamins are to the body.

 Investigate! What Are Vitamins and How Is Vitamin C
Used in the Body?
LAB INSTRUCTIONS

1. You are going to test foods for vitamin C presence by adding food to a solution of cornstarch and iodine.
2. Predict and discuss which foods you believe will contain vitamin C.
3. Test your knowledge! You will be working with various pipettes to measure liquid drops. Be sure to keep each pipette with the liquid it measures and work over your Lab plate.
4. Measure 30 mL of water in a graduated cylinder. Pour the water into Cup 1. Fill Cups 2, 3 and 4 each with 30 mL water. Place the water and cylinder back with the materials.
5. Fill the starch solution pipette with the starch solution (made from cornstarch and water) and put 10 drops in each cup of water. Place the pipette back with the solution.
6. Fill the iodine pipette with iodine and add two drops to each cup. (The solution should turn slightly blue.) Place the pipette back with the iodine.
7. Fill the number 1 pipette with its matching food and add three drops to Cup 1. If the blue disappears, the food contains vitamin C. If it does not, the food does not contain vitamin C. Repeat this step for food samples 2, 3 and 4. Be careful to keep each pipette with the food it measures.
8. Compare your predictions with the actual results. What did you find out?
9. Discard your solution in the large container marked DISCARDED TESTING SOLUTION. Thank you for cleaning up your area!

Read and discuss your Key Concepts!

What did you find out about Vitamin C and its
importance to your body?

Be sure to write what you have learned and stamp your
Passport to Good Health!

Investigate! What Are Vitamins and How Is Vitamin C Used in the Body?

Did you know you couldn't live without vitamins? Vitamins are needed in very small amounts to maintain good health. About a dozen vitamins have been identified as necessary for the human body. Vitamins must be included in your diet since the body usually does not produce them on its own. Some vitamins can be stored in body fat but others are water soluble and cannot be stored in the body. Water soluble vitamins must be eaten every day. Also, some vitamins need to partner with other vitamins to work properly.

Have you ever heard of scurvy? Lack of vitamin C can cause scurvy. Scurvy was common until scientists discovered the role of vitamin C in the body in 1928. It is estimated that scurvy killed two million sailors in the years 1500-1800, which is as many as were lost in battles or shipwrecks! It is still common today in countries where there is a lack of adequate foods. Scurvy causes loss of appetite, bleeding gums, loose teeth, swollen ankles, and skin problems.

Vitamin C cannot be stored in the body, so it must be a part of the daily diet. It is necessary to keep your skin, tendons, ligaments, and blood vessels healthy and helps wounds heal when you get hurt. It even helps repair bones when they are broken! Citrus fruits, such as oranges, grapefruit, and lemons, as well as cantaloupe, tomatoes, green peppers, broccoli, leafy vegetables and a few other fruits and vegetables, have lots of vitamin C in them. As you found out, sodas do not contain vitamin C!

Investigate! What's In Your Cereal?

Standards References

SCIENCE GLEs

Grade 1: 2

Grade 2: 6, 12

Grade 3: 34, 42

Grade 5: 20

MATH GLEs

Grade 1: 24

HEALTH Benchmarks

1-E-2

3-E-1

6-E-3

Materials

1. cereal fortified with iron (Test the cereal prior to purchasing large amounts for iron filings to ensure they are easily found.)
2. thin paper plates for the labs
3. ¼ C measuring cups
4. plastic sandwich bags (ziplock or fold-over)
5. small magnets or magnet wands (any shape)
6. hand lenses
7. wooden blocks
8. trash can

Activity Overview

Actual iron filings can be located in cereal that has been fortified with iron. Participants crush cereal inside plastic sandwich bags, pour the cereal onto a paper plate and use a magnet to locate the filings.

Key Concepts

- Iron filings can be seen in cereal.
- Iron is a mineral that is needed for good health. It is found in red blood cells' hemoglobin and carries oxygen and carbon dioxide.
- Iron is also found in enzymes and proteins and plays a major role in energy metabolism.
- Tools such as hand lenses can extend the senses.

Procedure

Preparation: Pour cereal into a large plastic bowl. Have all materials listed available at the Explore Station. Print Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the station. The food display, *Cereal Check*, described in the Appendix would enhance this activity.

1. You are going to conduct a test to find out what is in some cereals.
2. Please keep all materials on your lab plate.
3. Measure ¼ cup of cereal and pour the cereal into a sandwich bag. Be sure to pour it over your lab plate!
4. Use your hands to gently squish the cereal in the bag and crush it into small pieces. You may also use a wooden block, but press carefully so your bag doesn't burst!
5. Open your bag and pour the crushed cereal onto your lab plate.
6. Investigate the cereal with your hand lens and discuss what you see!
7. Use your magnet to further investigate what is in your cereal!
8. Thank you for cleaning up your lab area! Throw away your cereal and bag. Brush off the other supplies and return them to the station.
9. Read and discuss your Key Concepts! What did you find out about the cereal?
10. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under "Key Concepts" and discuss the importance of iron in maintaining good health.

Investigate! What's In Your Cereal? LAB INSTRUCTIONS

1. You are going to conduct a test to find out what is in some cereals.
2. Please keep all materials on your  plate.
3. Measure $\frac{1}{4}$ cup of cereal and pour the cereal into a sandwich bag. Be sure to pour it over your lab plate!
4. Use your hands to gently squish the cereal in the bag and crush it into small pieces. You may also use a wooden block, but press carefully so your bag doesn't burst!
5. Open your bag and pour the crushed cereal onto your lab plate.
6. Investigate the cereal with your hand lens and discuss what you see!
7. Use your magnet to further investigate what is in your cereal! Are you surprised at what you found?
8. Thank you for cleaning up your lab area! Throw away your cereal and bag. Brush off the other supplies and return them to the station.

Read and discuss your Key Concepts!

What did you find out about your body and its fuel?
Be sure to write what you have learned and stamp your
Passport to Good Health!

Investigate! What's In Your Cereal?

Guess what stuck to your magnet! Iron filings! Yes, this is the same iron that is used to make nails and all sorts of other things we use every day! Iron is great for making things, and it is also a mineral that is needed for good health! Who would ever think we SHOULD eat nails?

Iron is a mineral, which is one of six key nutrients needed for good health and growth. Most of the iron in the human body is in the red blood cells' hemoglobin. In fact, iron is what makes blood red! Hemoglobin carries oxygen from the lungs to every cell in the body, and without iron, hemoglobin cannot do its job. On hemoglobin's trip back to the lungs, iron carries carbon dioxide, which leaves the body when we breathe out or exhale.

Iron is also a part of vital enzymes and proteins and plays a major role in providing energy for our bodies.

There are two basic types of dietary iron:

- 1) Heme iron, that is easily absorbed by the body and accounts for 40 percent of the iron in meats.
- 2) Nonheme iron, that is not-so-easily absorbed. Nonheme iron is present in vegetables.

Our bodies can't live without iron! How well the body absorbs and uses iron also depends upon whether or not there is enough Vitamin C to help carry out the process. Antacids, high-fiber, coffee and tea inhibit the absorption of iron. Eating foods such as iron fortified cereal helps you make sure you get enough iron in your diet.

Investigate! Why Take Care of Your Teeth?

Standards References

SCIENCE GLEs
Grade 3: 34, 42

HEALTH Benchmarks

1-E-2

3-E-1

3-E-2

Materials

1. model of teeth (1 per family)
2. battery operated electric toothbrushes (1 per model)
3. stopwatch or timer (1 per model)
4. unwaxed dental tape or floss (not the easy slide which have been found to be less effective) enough for about 8" per participant
5. mirror (1 per family)
6. trashcan lined with plastic bag and labeled:
Discarded Dental Floss

Activity Overview

Participants use a model of the mouth and teeth and a toothbrush to demonstrate the correct method of brushing teeth. They use floss to practice flossing correctly on their own teeth.

Key Concepts

- Cavities occur when food is allowed to stay in contact with teeth.
- Plaque builds up on teeth and contains bacteria which promote tooth decay.
- Carbohydrates, particularly sugary snacks and candy, contribute to tooth decay. Avoiding sugary foods helps prevent tooth decay.
- Cleaning teeth after meals helps prevent cavities and gum diseases.
- Visiting the dentist at least two times a year is important to maintaining healthy teeth and gums. Young children should visit the dentist when they are two years of age.

Procedure

Preparation: Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the Explore Station with the materials.

1. You will demonstrate how to brush the teeth on the model. One family member brushes the tooth model while another times the process with the stopwatch or timer for two minutes. You will switch roles so each person gets a turn at brushing the teeth.
2. Each tooth should be brushed with the electric toothbrush carefully for a full 2 minutes to simulate the action required to remove all food particles and plaque. Electric toothbrushes are very effective in helping remove harmful bacteria. (At home, you would use a fluoride toothpaste.)
3. You need to allow 60 seconds for your top teeth and 60 seconds for your bottom teeth.
4. Brush UP and DOWN on the FRONT and BACK of each tooth!
5. Brush the TOPS of each tooth ACROSS and BACK as well as SIDE to SIDE.
6. After the 2 minutes are up, cut off about 8 inches of dental floss. Wrap an inch or so around your two index fingers and floss between each tooth.
7. It is important to floss from the gumline to the top of the tooth, being careful to move the floss along the sides of BOTH of the teeth you are flossing.
8. Dispose of the floss in the trashcan.
9. Thank you for cleaning up your lab!
10. Read and discuss your Key Concepts! What did you find out about the importance of brushing your teeth?
11. Be sure to write what you have learned and stamp your *Passport to Good Health!*

Closure/Evaluation

After completing the activity, families read the information found under "Key Learnings" and discuss why we need to take care of our teeth.

Investigate! Why Take Care of Your Teeth?

LAB INSTRUCTIONS

1. You will demonstrate how to brush the teeth on the model. One family member brushes the tooth model while another times the process with the stopwatch or timer for two minutes. You will switch roles so each person gets a turn at brushing the teeth.
2. Each tooth should be brushed with the electric toothbrush carefully for a full 2 minutes to simulate the action required to remove all food particles and plaque. Electric toothbrushes are very effective in helping remove harmful bacteria. (At home, you would use a fluoride toothpaste.)
3. You need to allow 60 seconds for your top teeth and 60 seconds for your bottom teeth.
4. Brush **UP** and **DOWN** on the **FRONT** and **BACK** of each tooth!
5. Brush the **TOPS** of each tooth **ACROSS** and **BACK** as well as **SIDE** to **SIDE**.
6. After the 2 minutes are up, cut off about 8 inches of dental floss. Wrap an inch or so around your two index fingers and floss between each tooth.
7. It is important to floss from the gumline to the top of each tooth, being careful to move the floss along the sides of **BOTH** of the teeth you are flossing.
8. Dispose of the floss in the trashcan.
9. Thank you for cleaning up your lab!

Read and discuss your Key Concepts!

What did you find out about brushing and flossing your teeth?

Be sure to write what you have learned and stamp your

Passport to Good Health!

Investigate! Why Take Care of Your Teeth?

Did you know that taking care of your teeth keeps your whole body healthy? Your teeth begin the digestion process when you chew your food, and decayed teeth can actually make you sick! Although teeth are strong and are designed to last your entire lifetime, **cavities** caused by **plaque** can weaken and even destroy your teeth.

Plaque is the sticky, slimy substance you feel on your teeth when you don't brush them. It is formed when food particles mix with bacteria and acids in your mouth and are allowed to stay in contact with your teeth. Plaque destroys the enamel in the outermost layer of your teeth; once the hard outer layer of your tooth is destroyed, the inside parts will also begin to decay.

PREVENT CAVITIES and GUM DISEASES:

- a. Brush your teeth for two minutes after meals.
- b. Avoid eating a lot of candy, cake, cookies and other sugary foods and drinking sugar-laden juices and sodas.
- c. Visit your dentist at least twice a year to remove plaque and catch problems early.
- d. Begin visits to the dentist at the age of two.

Try this at home to see how well you are brushing your teeth:

Mix four drops of red food coloring in a small bathroom cup half-filled with water. Swish the colored water around your mouth. Check for red flecks on your teeth! These are areas you missed!

Investigate! Your Skin

Standards References

SCIENCE GLEs

Grade 2: 12

Grade 4: 7, 9

HEALTH Benchmarks

1-M-2

3-M-1

Materials

1. onion skins that have been cut into small pieces and stored in a plastic bag.
2. 2 hand lens per family.
3. 1- 2 microscopes per family. (The handheld microscopes are recommended as they allow the participants to explore various objects quickly and easily at 10X power.)
4. 1 quarter or half sheet of paper per person
5. crayons

Activity Overview

Participants examine onion skins through a hand lens and a handheld microscope and compare the onion skins to their own skin. They discuss the differences and similarities between the two coverings, and draw comparisons.

Key Concepts

- The skin is one of the body's major organs and protects the body from harmful agents.
- The skin helps regulate the body's internal temperature.
- The skin interacts with other organs in the body.
- Vitamin D is a fat soluble vitamin that is found in food and is also made in the body as a result of ultraviolet (UV) ray exposure. It is important to expose skin to limited amounts of UV rays as they trigger vitamin D synthesis in the skin.
- Ultraviolet rays from the sun can cause premature aging and cancer.

Procedure

Preparation: Have all materials available at the Explore Station. Print the Key Concepts Card and Lab Instructions Card on heavy cardstock and place at the station.

1. You are going to compare your skin to that of an onion!
2. Keep all of your materials on the lab!
3. Take one piece of onion skin from the plastic bag and examine it with your hand lens. Examine your own skin with the hand lens.
4. Discuss how an onion's skin is like or unlike your skin. What other foods have "skins" or coverings on them? Why do you think they have skins?
5. Use the handheld microscope to further examine the onion skin and your own skin. Be sure to place the microscope directly over each skin so that it is touching it.
6. Use the crayons to draw what you see and compare the two skins.
7. What are the functions of the skins? Why do we have skins?
8. Thank you for cleaning up your lab area! Place your onion skin back in the plastic bag.
9. Read and discuss your Key Concepts! What did you find out about your skin?
10. Be sure to write what you have learned and stamp your *Passport to Good Health!*
11. If you have extra time, use the handheld microscope to explore your clothing and other objects!

Closure/Evaluation

After completing the activity, families read the information found under "Key Concepts" and discuss the function of skin and how necessary it is to produce vitamin D, but care should be taken to avoid excessive UV rays. Families should be encouraged to go the table of ready-to-eat cereals to compare nutrition labels of cereals fortified with Vitamin D.

Investigate! Your Skin LAB INSTRUCTIONS

1. You are going to compare your skin to that of an onion!
2. Keep all of your materials on the Lab plate!
3. Take one piece of onion skin from the plastic bag and examine it with your hand lens. Examine your own skin with the hand lens.
4. Discuss how an onion's skin is like or unlike your skin. What other foods have "skins" or coverings on them? Why do you think they have skins?
5. Use the handheld microscope to further examine the onion skin and your own skin. Be sure to place the microscope directly over each skin so that it is touching it.
6. Use the crayons to draw what you see and compare the two skins.
7. What are the functions of the skins? Why do we have skins?
8. Thank you for cleaning up your lab area! Place your onion skin back in the plastic bag.

Read and discuss your Key Concepts!

What did you find out about your skin?

Be sure to write what you have learned and stamp your

Passport to Good Health!

If you have extra time, use the handheld microscope to explore your clothing and other objects!

Investigate Your Skin!

We don't often think of our skin as being one of our body's vital organs, but it is! Skin is the largest organ and one of the most complex. It interacts with many other organs. Its main purpose is to act as a "protector!" It provides an external barrier from stressors: disease, infection and environmental factors such as the sun, wind and rain. Your skin plays an important part in your appearance. By taking care of your skin, you help it do its job.

Protector — Your skin works hard at keeping you healthy! It comes into contact with harmful agents, such as bacteria, viruses and allergens, and it works to protect your body from their effects. Your skin also helps regulate your body temperature. When you exercise or have a fever, for example, it allows you to sweat so that your internal temperature remains regulated. The skin can do all this while keeping you protected from everyday assaults from the environment, such as sun, wind, heat, cold, dryness, pollution and even cigarette smoke. All these factors can damage the skin, limiting its protective function.

Mirror — Your skin is like a mirror because it reflects your health. It interacts with other organs and can alert you to health problems that may be going on in your body. When you are healthy, your skin looks great. When you are sick, under stress, or do not consume the necessary vitamins and minerals to keep your skin healthy, it shows it.

Protect your skin:

- The sun, which emits harmful ultraviolet (UV) rays, is your skin's most formidable enemy! While you need some sun, 15 minutes three times per week, to produce vitamin D, the sun can be deadly to your skin. It causes premature aging and cancer! Help protect your skin and prevent skin cancer by daily using at least SPF 15 sunscreen. When working or playing outdoors for long periods of time, use a higher SPF sunscreen, wear protective clothing, and avoid overexposure to the sun or artificial exposure to UV rays in tanning salons. Be alert to any changes in your skin, and see a doctor any time there is a change.
- Good sources of Vitamin D are fortified dairy products and cereals. Cheeses and ice cream generally are not made from fortified milk. Tuna and salmon are good sources of Vitamin D as well.