Exploring the Human Body

MISSION 3

Exploring the Human Body provides information and activities designed to explore how our bodies digest food to produce energy for all our body systems.

Curriculum Connections for Grades 4 - 6

Students will:

1. Explore ways in which humans use their senses to meet their needs.
2. Describe the basic structure and function of the major organs in the digestive system.
3. Understand how the digestive system works to digest food.
4. Describe the types of nutrients in foods (e.g. carbohydrates, fats, proteins, vitamins and minerals) and their importance in maintaining a healthy body.
5. Identify starchy foods that supply carbohydrates.
6. Recognize carbohydrates as the body's primary source of food energy.

Teaching Background Information

TASTE BUDS

Primitive people relied on their taste buds as important danger detectors. If a leaf, berry or bush tasted bitter, it probably was bad or even poisonous, so they spit it out. Humans are born with a natural liking for sweet foods. It is believed that our taste preference for sweet was a protective mechanism to direct early humans toward safe (not poisonous, not spoiled) foods that provided food energy. Now, we use our taste buds to help us determine how good something tastes, more often than for safety.

INSIDE YOUR BODY

The human body is truly fascinating. Like a car, it is made up of thousands of parts that all work together. Each part is made up of tiny cells. Each cell has a job to do, and all cells work together to keep you alive and well. Groups of similar cells that do a special job form tissues such as skin, muscle, and bone. Different tissues working together form organs such as your heart, lungs, and stomach. A group of different organs that work together to do a particular job forms a system such as the circulatory, respiratory, or digestive system. Just like a car needs fuel to run, the body needs food to provide energy for all body parts to work.

AMAZING CELLS

All living organisms (both plants and animals) are made up of cells. Simple organisms have few cells compared to complex animals. The human body contains about 50 trillion cells (50,000,000,000,000). Most cells are too small to see without a microscope. In fact most cells are so tiny that over 200 of them could fit into a period at the end of a sentence. Cells come in different shapes and sizes, depending on their job. Muscle cells are long and can shorten or lengthen to allow you to move. Nerve cells have long fibres that send messages around your body. Red blood cells are disk shaped and can transport oxygen. Cells make copies of themselves by growing larger and then splitting in two. The body uses new cells to grow and heal itself.

THE DIGESTIVE SYSTEM

The digestive system turns food into fuel for the body, providing energy and nutrients for tissue growth and repair. The digestive system chops up the food and breaks it down, so that the nutrients can be absorbed and used by cells throughout the body. Overhead 3:1 (page 48) provides an overview of the digestive system.

The digestive system works like a giant food processor. This system is made up of a group of body parts that break down food both mechanically and chemically. Digestion begins in the mouth. Teeth grind up food, the enzymes in saliva begin to digest it, and the tongue helps roll it into a ball that can be swallowed. Food then travels down the esophagus into the stomach where it is churned up and mixed with very strong digestive juices. From the stomach, the food flows through the small intestine where nutrients from the food are absorbed into the blood.

The Circulatory System carries food energy throughout the body in the form of glucose, other nutrients, and oxygen. The blood also transports wastes from the cells so that the body can remove them. The heart works like a pump to push blood all around the body. The large intestine holds the food that cannot be digested and passes it out of the body. The whole digestion process takes about 24 hours.

FOOD ENERGY

Food is the fuel that gives the body energy. Food energy is measured in units called Calories. All of the body's activities use up energy. If a car travels very fast it uses more fuel than if it goes slowly. In much the same way, the body uses more Calories when exercising than when sleeping. The body still uses Calories even when asleep to maintain proper function of the heart, lungs, digestive system, and nervous system. When more food energy is consumed than needed for daily activities, excess energy is stored and used for energy at a later time.

KEY NUTRIENTS

The body needs five types of nutrients for life: carbohydrate, fat, protein, vitamins, and minerals, plus water. Carbohydrate (mainly sugars and starches) is the body's preferred source of food energy. Carbohydrate is broken down by the body into an important nutrient called glucose. Glucose circulates in the blood to provide energy for cells all over the body. Fat is another key source of food energy, but the requirement for fat is less than for carbohydrate. Protein provides the building blocks for cells, so they can help your body grow and repair itself. Proteins also provide energy. Vitamins and minerals work in cells throughout the body to help maintain health. For example, vitamin A aids in night vision, and the mineral calcium is important for bone health and development. The body needs a healthy balance of all of these nutrients plus plenty of water for peak performance.

Teacher Planning for Student Activities

Activity 3:1 TONGUE DETECTOR

PURPOSE: To provide students with an opportunity to explore the ways in which humans use their senses to meet their needs.

CURRICULUM CONNECTIONS:
1

KNOWLEDGE AND SKILL DEVELOPMENT:
Science

TEACHER NOTES:
Although all areas of the tongue can detect taste sensations (including sweet, sour, salty and bitter), the level of sensitivity to these tastes on different areas of the tongue varies among individuals. This experiment allows students to identify the areas of their tongues that are most sensitive to each of these tastes. The activity is divided into two separate parts which can be completed on different days. In part one, students will taste different solutions to determine which taste sensation each solution provides, and which parts of their tongue are most sensitive to these sensations. In part two, students will taste and describe solutions of water, lemon juice, and varying amounts of sugar.

ASSESSMENT AND EVALUATION:
Students should be able to identify four taste sensations by accurately completing the table in part 1A (page 53). In part 1B, the tongue diagram can be used for students to label the areas of their tongues that are most sensitive to these sensations. Because each individual is different, there are no right or wrong answers to this diagram. In part 2, students should be able to describe levels of sweetness of each solution and draw conclusions.

Activity 3:2 YOUR DIGESTIVE SYSTEM

PURPOSE: To help students explore the different organs that make up one of the body's main systems - the digestive system - and learn about the nutrients found in foods and their importance in maintaining a healthy body.

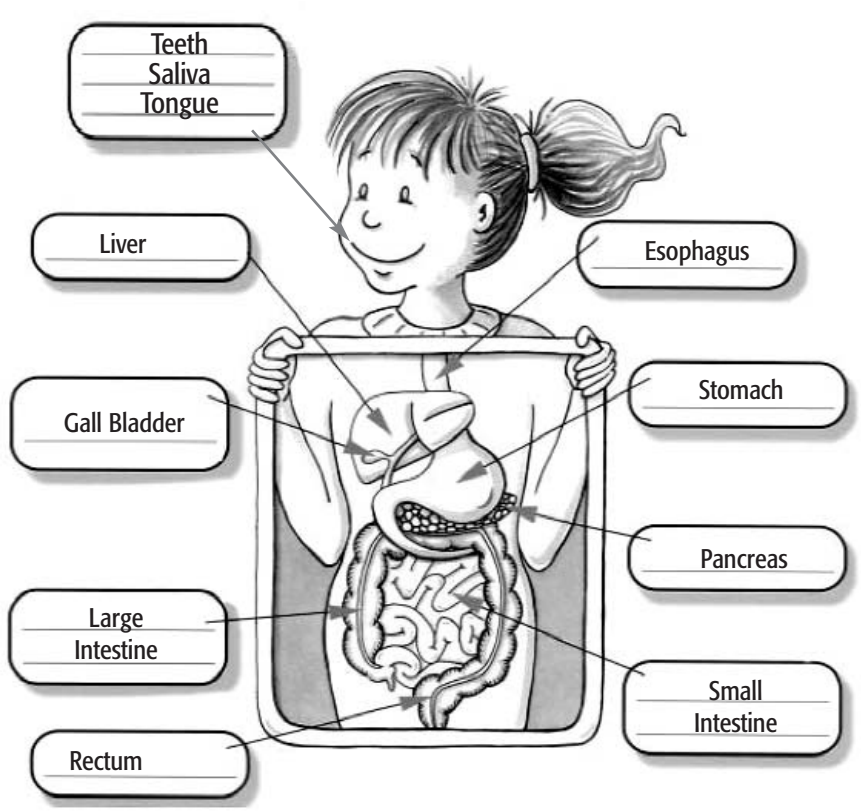
CURRICULUM CONNECTIONS:
2, 3, 4

KNOWLEDGE AND SKILL DEVELOPMENT:
Science, Health and Physical Education, English Language Arts

TEACHER NOTES:
This activity provides a framework for students to research and learn about the digestive system as well as the nutrients found in foods and their role in maintaining a healthy body. Encourage students to do their own research in the library, in an encyclopedia, or on the internet to explore the digestive system and key nutrients (carbohydrate, fat, protein, vitamins and minerals). Once they have explored this system, they can research other body systems as well.

ASSESSMENT AND EVALUATION:
Use the answer key on page 46 as well as the glossary to ensure that students have the correct answers. Overhead 3:1 (page 48) can be used for class discussion.

ANSWER KEY - Activity 3:2



Answer Key for Student Responses (page 56):

1. Esophagus
2. Liver
3. Teeth
4. Stomach
5. Saliva
6. Large Intestine
7. Rectum
8. Tongue
9. Small Intestine
10. Gall Bladder

Activity 3:3 FIND A STARCHY FOOD

PURPOSE: To identify foods that provide energy from carbohydrate in the form of starches, and help students understand that carbohydrate is digested into sugars for the body to use for energy.

CURRICULUM CONNECTIONS:
5

KNOWLEDGE AND SKILL DEVELOPMENT:
Science

TEACHER NOTES:
Foods derived from plants all contain carbohydrate in the form of sugars or starches. Plants can store sugars in a large chain called starches. The experiment in Activity 3:3 will help students identify starchy foods. Iodine can be used to detect the presence of starch because it turns a blackish purple colour when it reacts with starch. Potatoes and bread contain carbohydrate in the form of starches. Meat and cheese contain mainly protein and fat. This activity is best conducted in small groups. An ideal group size would be 5 to allow each member of the group to test one of the samples.
**Children should be instructed to use care when working with iodine because it is poisonous if ingested and can stain.

ASSESSMENT AND EVALUATION:
The evaluation rubric (page 49) may be used to assess students' responses.

Activity 3:4 YOUR FOOD PROCESSOR

PURPOSE: To help students discover the process of digestion and understand that high-carbohydrate foods are used most efficiently by the body.

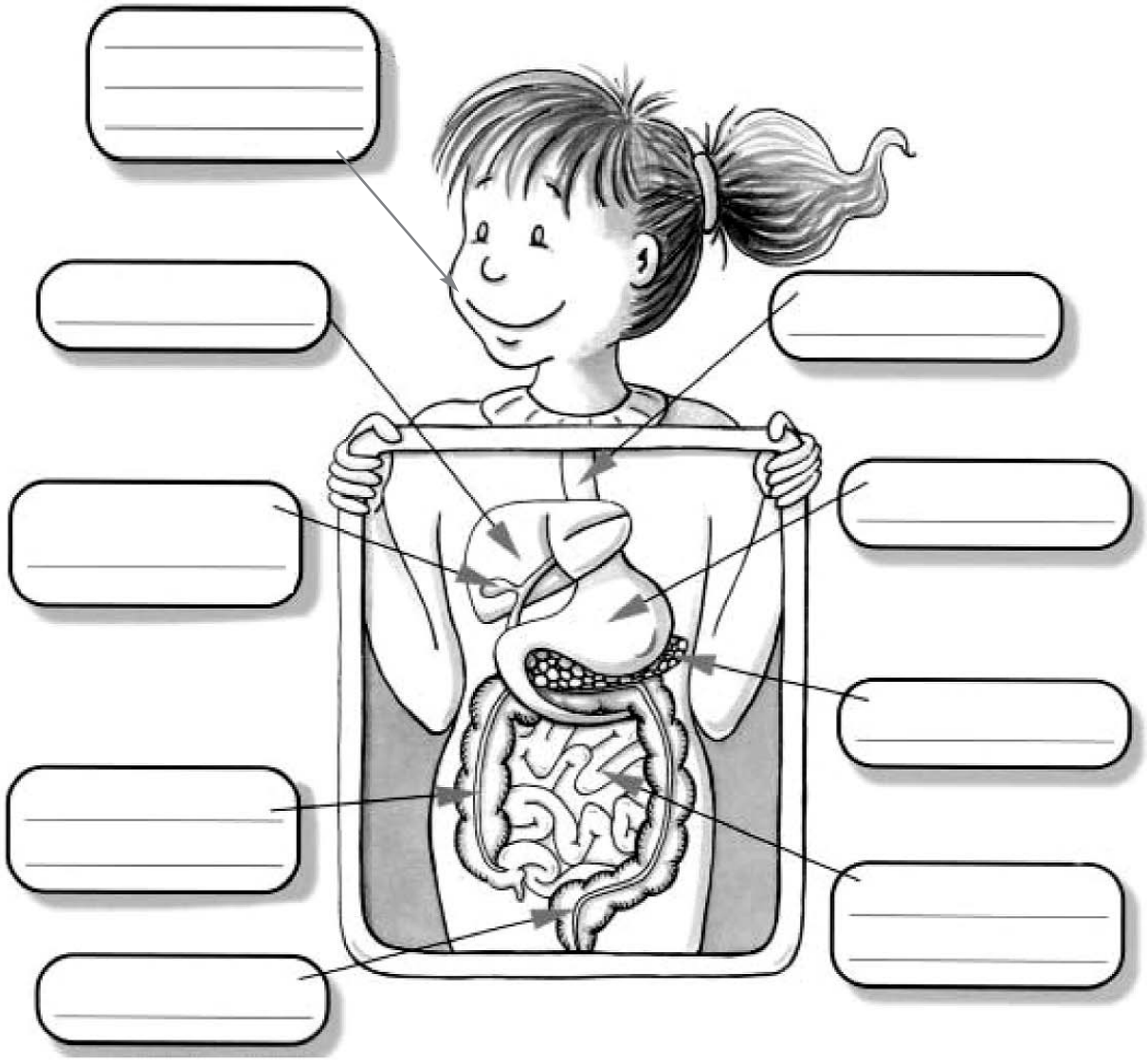
CURRICULUM CONNECTIONS:
3, 6

KNOWLEDGE AND SKILL DEVELOPMENT:
Science, Health and Physical Education

TEACHER NOTES:
By following the instructions on Activity Sheet 3:4, students create an "artificial stomach" and watch a simulation of how the stomach breaks down foods. Some foods take longer than others to break down, such as those that contain a lot of protein (meat, cheese) or fat (butter, margarine). High-carbohydrate foods containing sugars and starches, like bread, cereal, vegetables and fruit break down the quickest. Carbohydrates are broken down and converted into blood sugar called glucose. The glucose is released into the bloodstream to provide energy for the brain and body. The stomach is only part of the process of changing food into fuel. The small intestine completes digestion and sends nutrients from digested foods into the bloodstream. Place students into small groups to complete this activity.

ASSESSMENT AND EVALUATION:
The Student Self Reflection questions (page 65) included as part of the activity may be used for assessment purposes.

OVERHEAD 3:1



Evaluation Page

ACTIVITY 3:3

Evaluation Rubric - Find a Starchy Food

Criteria	Level 4	Level 3	Level 2	Level 1
Safety Skills	Practices safety skills with exceptional care	Practices safety skills with considerable care	Practices safety skills with some care	Practices safety skills with limited care
Understanding of Concepts	Responses to questions indicate exceptional understanding of the concepts	Responses to questions indicate considerable understanding of the concepts	Responses to questions indicate some understanding of the concepts	Responses to questions indicate limited understanding of concepts
Follows directions and applies concepts	Follows directions for experiment and applies concepts with exceptional accuracy	Follows directions for experiment and applies concepts with considerable accuracy	Follows directions for experiment and applies concepts with some accuracy	Follows directions for experiment and applies concepts with limited accuracy

Glossary

MISSION 3

CARBOHYDRATE - nutrient produced naturally by plants, consisting mainly of sugars and starches; the body's preferred source of energy.

CELLS - microscopic living units, each with a special job to do, that make up your body parts including your skin, blood, muscles, and brain.

DIGESTION - the process by which food is broken down by the body into smaller parts that it can use.

ENZYMES - proteins in the body that speed up or initiate chemical reactions, like breaking down (digesting) food.

FAT - nutrient that is a concentrated source of food energy and performs many important functions in the body.

GLUCOSE - the main form of carbohydrate that is absorbed by the body as a source of food energy for all cells; glucose is one of the sugars naturally produced by plants and is obtained by the complete digestion of other carbohydrates.

MINERALS - single nutrient elements (e.g. sodium, iron, calcium) needed in small amounts to perform specific body functions and for normal growth and good health.

NUTRIENTS - substances found in foods needed by the body for energy, healthy growth, and body functions.

ORGANS - different tissues working together such as the heart, lungs, and stomach.

PROTEIN - nutrient that provides building blocks for growth and repair of the body, as well as a source of energy.

SYSTEM - a group of different organs that work together to do a particular job form a system, such as your circulatory, respiratory, and digestive systems.

TISSUE - groups of similar cells that do a special job such as your skin, muscle, and bone tissue.

VITAMINS - nutrient compounds containing carbon, needed in tiny amounts to perform specific body functions and for normal growth and good health.

Additional Resources

MISSION 3

BOOKS

How the Body Works
By Steve Parker
Reader's Digest
192 Pages (1999)
ISBN: 0762102365
A great resource for teaching children in grades 4 to 7 about the human body with fun and easy experiments to do in the classroom or at home.

Head to Toe Science
By Jim Wiese
John Wiley & Sons
128 Pages (2000)
ISBN: 0471332038
Over 40 eye-popping, spine-tingling, heart pounding activities and answers to interesting questions to teach 9 to 12-year-olds about the human body.

The Incredible Human Body
By Esther Weiner
Scholastic
96 Pages (1999)
ISBN 0590599283
Engaging hands-on activities to help students explore the major body systems.

Uncover the Human Body
By Luann Colombo, Jennifer Fairman, Craig Zuckerman
Silver Dolphin
16 Pages (2003)
ISBN 1571457895
This book-model combination takes some of the mystery out of how the body works. It covers all the major systems and processes. Children get to look at each system on a different page, then by closing the book, combine them into a whole.

Human Body, Grades 4-6: Fun Activities, Experiments, Investigations, and Observations!
By Sue Carothers, Elizabeth Henke
Carson-Dellosa Publishing Company
128 Pages (2006)
ISBN 088724954X
Includes detailed diagrams of each body system!

Break It Down: The Digestive System
By Steve Parker
Raintree
48 Pages (2006)
ISBN 1410926583
Using interesting photos and facts, this book will really make you think about the body and the amazing things that go on inside you every second.

ELECTRONIC RESOURCES

Healthy Canadians - Your Source for a Healthier Lifestyle
www.healthycanadians.ca
This website provides information about healthy lifestyles including Eating Well with Canada's Food Guide and information about food and consumer safety.

Kids Health - How the Body Works
http://kidshealth.org/kid/htbw/
Kids Health is the most-visited site on the Web for information about health, behavior, and development from before birth through the teen years. Watch movies, take quizzes, read articles, solve word finds, and do activities - all about the parts of the body!

ACTIVITY 3:1

Tongue Detector

Your five senses connect you to the world around you. One of their primary jobs is to help you tell if your environment is safe or not. Taste, for example, can help you detect if a food is fresh and good to eat or spoiled and dangerous to your health.

We inherited a natural liking for foods rich in carbohydrates (starches and sugars) from our ancestors. Early humans relied on their taste buds as important danger detectors. If a leaf, berry or bush tasted bitter, it probably was bad or even poisonous, so they spit it out. Humans are born with a natural liking for sweet foods to direct us toward safe (not poisonous, not spoiled) foods that provide food energy.

Carbohydrate foods not only taste great, they're also full of energy. Primitive people needed a lot of energy to survive in cold weather, on long walks, and to get away from animals.

Whenever you put food in your mouth your taste buds get busy! Discovering different flavours in foods is part of what makes eating so much fun. Take a look at a classmate's tongue and you will see lots of bumps. Around the base of these bumps, there are taste buds. You have about 10,000 taste buds. Inside them are special cells that sense taste. There are different kinds of taste buds, each designed to help you taste different sensations. These taste sensations include sweet, salty, bitter, and sour. Some areas of your tongue may be better than other areas in detecting each of these tastes.

Student Directions

Try this taste test to see if you can identify four basic tastes while blindfolded. Then try to figure out which parts of your tongue can best detect each of these four tastes.

Part 1A

1. In groups assigned by your teacher, collect the following items for your experiment:

✓ 1 blindfold
✓ 4 small sampling cups
✓ 15 mL (1 tbsp) of sugar
✓ 5 mL (1 tsp) of salt
✓ 30 mL (2 tbsp) of lemon juice
✓ 30 mL (2 tbsp) of tonic water
✓ 1 measuring spoon (15 mL / 1 tbsp)
✓ 8 q-tips (per student)
✓ 1 glass of water (per student)

2. Label the 4 cups as sugar, salt, lemon juice and tonic water.

3. Put the sugar, salt, lemon juice, and tonic water in each of the four separate cups. Add 15 mL (1 tbsp) of water to the sugar sample and 30 mL (2 tbsp) of water to the salt sample. Mix both of these samples well using the measuring spoon, but be sure to rinse it off in between.

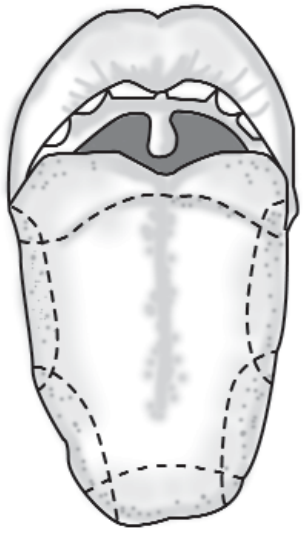
4. Taking turns with your classmates, blindfold each other and taste a little bit of each of your own samples using the clean end of a q-tip each time. Rinse your mouth by drinking a little water in between tasting each sample. Match each sample with the taste sensation it provides (salty, sour, bitter or sweet) and record your answers in the table below.

Remember to rinse your mouth by drinking a little water in between each sample.

SAMPLE	TASTE
Sugar	
Salt	
Lemon Juice	
Tonic Water	

Part 1B

Taste each of your four samples again **one at a time** to try to determine whether certain parts of your tongue are more sensitive to the taste sensations than others. Follow these instructions for each sample: dip the clean end of a q-tip in one of the samples, and then place it on the tip of your tongue, then the back of your tongue, then the sides near the tip of your tongue and finally the sides near the back of your tongue. Which parts of your tongue can best detect each of these tastes? Label the diagram of the tongue below to indicate the areas of your tongue that are most sensitive to each of the four tastes. After you have labelled your tongue diagram, compare your diagram to the diagrams of a few of your classmates.



Part 2 - Which taste do you like best?

1. In groups assigned by your teacher, collect the following items:

✓ 1 measuring cup (250 mL / 1 cup)
✓ 200 mL (3/4 cup) of water
✓ juice of two lemons or 30 mL (2 tbsp) of lemon juice
✓ 20 mL (1 tbsp + 1 tsp) of sugar
✓ 1 small cup (per student)

2. Add the juice of two lemons (or 30 mL / 2 tbsp of lemon juice) to the 200 mL (3/4 cup) of water in the measuring cup.

- Then add 5 mL (1 tsp) of sugar to the lemon solution, stir, and taste by pouring a little in each person's cup.
- Describe the taste in the chart below.
- Add the rest of the sugar to the lemon solution, 5 mL (1 tsp) at a time.
- Stir and taste each solution by pouring a little in each person's cup.
- Describe the taste of each solution in the table below.

	TASTE	DESCRIPTION
with 5 mL of sugar		
with 10 mL of sugar		
with 15 mL of sugar		
with 20 mL of sugar		

3. How much sugar would you add to make the Lemon Drink Solution taste right for you?

_____

_____

What can you conclude?

_____

_____

_____

_____

ACTIVITY 3:2

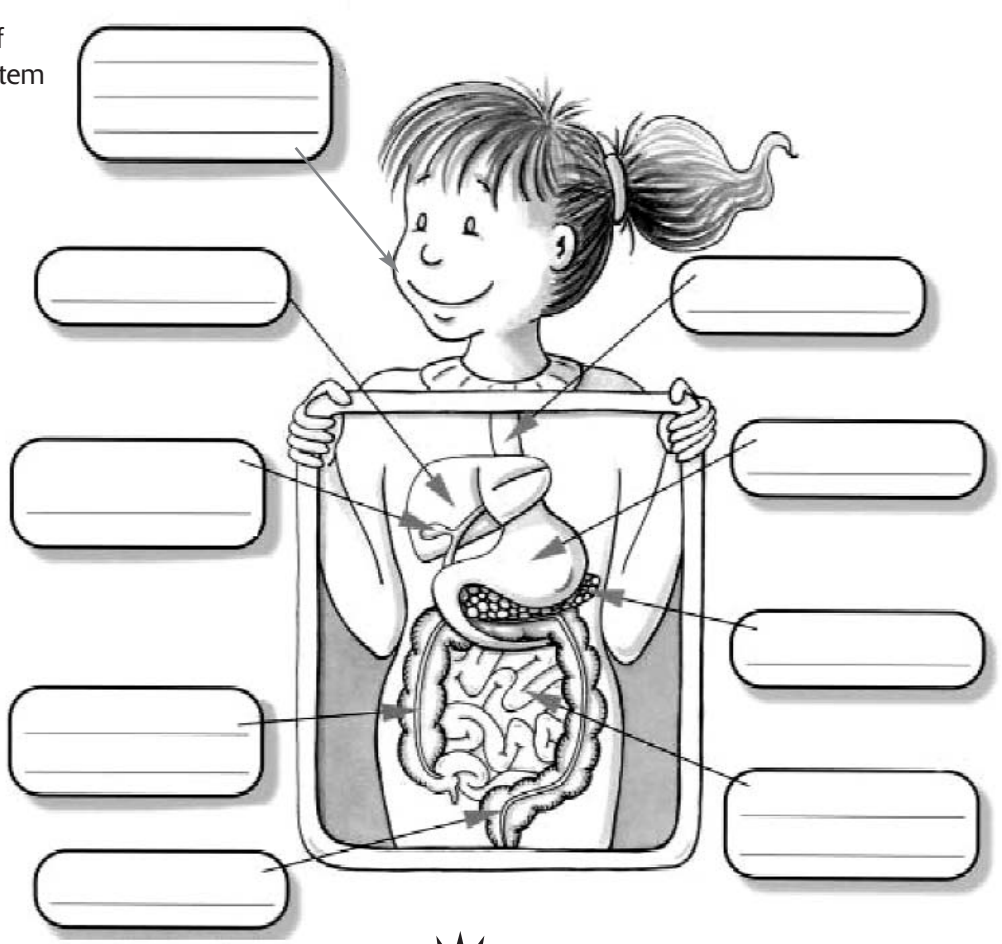
Your Digestive System

When you eat, the food you put in your mouth goes on a fascinating journey through your digestive system. Your digestive system is made up of many organs that all have a special job to do in digesting the food you eat. It takes about 24 hours for food to travel through your whole digestive system. The food that you eat is broken down into nutrients that your body can use for energy and to grow and repair itself.

Student Directions

The following diagram shows all the major organs in the digestive system. Try to name each organ that helps digest your food on its journey. Don't hesitate to use a dictionary, encyclopedia, the internet, or books about the human body to help you fill in the blanks. Answer the questions that follow and discover other fascinating details about how your body works.

Label the Parts of the Digestive System



Student Responses

Each organ in your digestive system does a specific job. Use each of the descriptions below as a clue to help you label the parts of the digestive system and the role each plays in your body.

1. A 25 cm long muscular tube that pushes food from your mouth to your stomach. _____

2. This is the body's biggest internal organ that performs many tasks, including storing energy and helping the body get rid of toxins. _____

3. These help break your food down into smaller bits you can swallow. _____

4. When empty, it has a volume of about 60 mL (about the size of a small yogurt cup), but it can hold up to about 2 litres (about the size of a large milk carton) of food after a big meal. _____

5. A liquid containing enzymes that begins to digest carbohydrates in your mouth. _____

6. Where undigested parts of food are held, and water is absorbed into your body. _____

7. The exit of the 9 meter long tube called your digestive system. _____

8. It helps mash your food up, mix it with saliva in your mouth and roll it into a ball that you can swallow. _____

9. A 6.5 meter long tube all coiled up inside you, from which nutrients are absorbed into your body. _____

10. A small pouch that stores bile made by the liver and then releases it to help with digestion of food leaving the stomach. _____

Enrichment Activity:

Research and describe the role of each of the following types of nutrients in maintaining a healthy body:

- Carbohydrate

_____

_____

_____

_____

- Fat

_____

_____

_____

_____

- Protein

_____

_____

_____

_____

- Vitamins

_____

_____

_____

_____

- Minerals

_____

_____

_____

_____

ACTIVITY 3:3

Find a Starchy Food

Plants store food energy in the form of carbohydrates for their growth and repair. Sugars are the foods that all plants produce naturally, using the sun's energy. In order to store large amounts of food energy, plants store sugars in large chains called starches. Sugars and starches are carbohydrates, your body's preferred source of energy.

Student Directions

In groups determined by your teacher follow the directions for this experiment. Iodine is used as a starch detector to find out which foods provide you with food energy from carbohydrates.

1. Cover your work surface with newspaper.

2. One person from your group collects:
- ✓ 1 paper plate
- ✓ 1 paper cup
- ✓ 1 eye dropper or 1 plastic straw
- ✓ 1 quarter slice of bread
- ✓ a few pieces of cooked macaroni
- ✓ 1 piece of cooked potato
- ✓ 1 slice of hardboiled egg
- ✓ 1 piece of cheese

3. Put each of the food items that you collected on your paper plate.

4. Fill the paper cup half full with water. Then ask your teacher to add a few drops of iodine and mix it in gently.

CAUTION	**Iodine is poisonous - do not taste it! Iodine can also stain your clothes, skin, or work surface - so take care not to spill it.**

5. Use an eye dropper to collect a small amount of the iodine solution, or dip one end of the straw into the solution in the paper cup and cover the other end with one of your fingers. This will trap a little of the iodine solution in the bottom of the straw. Keeping your finger on the end, you can now lift the straw up and the iodine will not drip out of the bottom of the straw.

6. Take turns with your group members, placing a drop of iodine solution onto the foods on your plate. Each member of the group can deposit the iodine onto a different food.

Student Responses

1. Observe the colour of the iodine solution when it is added to each food and record your results in the table below.

SAMPLE	COLOUR OF THE IODINE
Bread	
Macaroni	
Potato	
Egg	
Cheese	

2. Iodine changes to a blackish-purple colour when it comes into contact with starches. Which foods made the iodine change colour?

3. What can you conclude from your observations?

When you have finished this experiment, dispose of all the food samples, as well as the iodine solution and the paper cup, plate and plastic straw that you used. Use your school's recycling containers as well as garbage containers.

Wash your hands thoroughly.

ACTIVITY 3:4

Your Food Processor

Food gives you energy for all your body parts to work. You need food energy for your heart to beat, your lungs to breathe, your brain to think, and for your favourite activities such as rollerblading, snowboarding, cycling, swimming, and soccer.

Your digestive system works like a giant food processor to break down the food you eat into nutrients that your body can use for energy and to grow and repair itself. Your stomach is an important organ in your digestive system. The digestive juices in your stomach contain strong acids and proteins called enzymes to digest foods.

Some foods are digested more quickly than others for the body to use as energy. Carbohydrate foods, including sugars and starches, are converted into energy the quickest. Foods that contain mostly protein and fat take longer to digest.

Student Directions

In a small group, follow the instructions below to make an artificial stomach to help you see how the stomach works to digest food and how the body digests some foods more quickly than others.

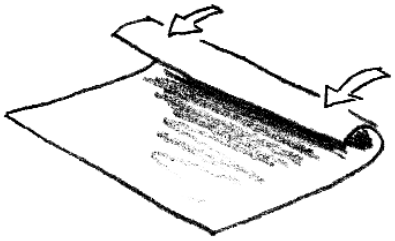
Each member of your group will take one of the following roles:

- a recorder
- a stomach holder
- a food giver

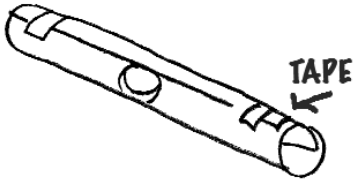
1. Collect the following items for your experiment with your group:

- ✓ half a page of acetate transparency or plastic page protector
- ✓ transparent tape (you can share a roll with other groups)
- ✓ scissors
- ✓1 large plastic self-sealing freezer bag
- ✓1 plastic knife
- ✓1 paper plate
- ✓ 1 measuring cup
- ✓ 200 mL (3/4 cup) of lemon juice concentrate
- ✓ 1 teaspoon of sugar (5 mL)
- ✓ 2 soda crackers
- ✓ 1/2 slice of bread
- ✓ 1 slice of cheese
- ✓ 1/2 slice of luncheon meat

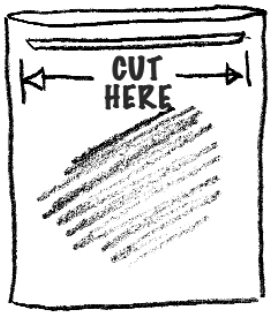
2. To make an artificial stomach, roll up the plastic page (from the short end) to form a tube about 2.5 cm in diameter. Tape the ends securely.



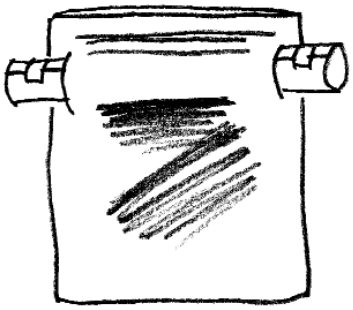
3. Use the scissors to cut a hole about the size of a quarter in the middle of the plastic tube.



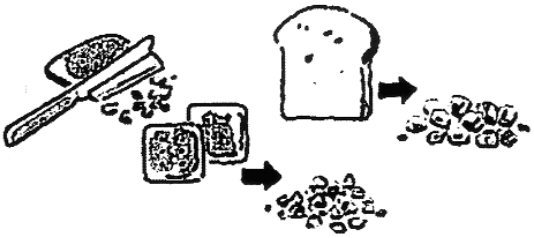
4. Use the scissors to cut two vertical slits, about 5 cm long each, in the plastic bag below the self-sealing line, one near each edge of the bag so the tube can slide in.



5. Slide the tube into the bag through the slits so that the hole in the tube is in the middle and facing down into the artificial stomach. Tape the tube in place, but don't worry about making the bag totally water tight around the tube. Keep the artificial stomach upright at all times to prevent spills.

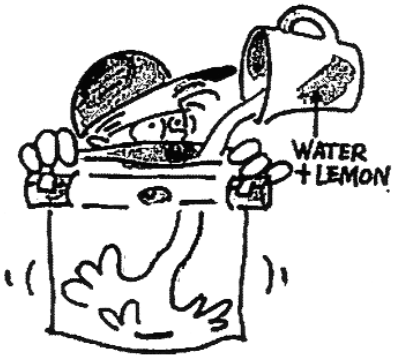


6. Prepare the food for the stomach, just like your teeth do by breaking it into small pieces so they are easier to digest. Break the crackers and bread into tiny bits using your hands and cut the meat and cheese into tiny bits using the plastic knife.



7. Adding acid to the artificial stomach.

- The stomach holder of the group should hold the artificial stomach by the tube while the food giver pours the 200 mL (3/4 cup) of lemon juice concentrate into the open bag.
- Using the measuring cup, the food giver measures 200 mL (3/4 cup) of lukewarm water and adds it to the bag. This mixture is acidic and can help to break down foods, kind of like your stomach juices (although your stomach juices have special enzymes and much stronger acid).
- The stomach holder seals the bag. Remember not to put your artificial stomach down once it has been filled with liquid!



8. Adding food to the artificial stomach

- While the stomach holder holds the artificial stomach, the food giver should push each food sample, one at a time, into the tube so that they fall through the hole and into the stomach.
- After adding each food, the food giver should use his/her hands on the outside of the bag to squish the contents of the bag for one minute. This is like the work your stomach muscles do to mix the food with the digestive juices.
- Let the food sit in the bag for another 3 minutes before adding the next food.
- Add the foods in the order they are listed in the table below (start with sugar, then add soda crackers, bread, cheese, and luncheon meat, in that order).

Student Responses

1. Observe the appearance of each food in the artificial stomach after one minute and three minutes. The recorder of the group should write your group's observations in the chart below.

SAMPLES	APPEARANCE	
	AFTER 1 MINUTE	AFTER 3 MINUTES
Sugar		
Soda Crackers		
Bread		
Cheese		
Luncheon Meat		

2. When you have added all the foods, continue mixing the foods by squeezing the bag with your hands, taking turns, for another five minutes. Then, based on all of your observations, answer the following questions:

Which type of food is digested the most quickly by the stomach?_____

_____

Which foods can you still see at the end of this activity? _____

_____

Which foods are made up of mostly carbohydrates? _____

_____

Which foods are made up of mostly proteins and fats? _____

_____

Are there any other observations or comments about your experiment you want to share?

_____

_____

STUDENT SELF REFLECTION

1. Did you enjoy doing this experiment? Explain your answer. _____

_____

_____

2. Did your group work well together? Explain your answer. _____

_____

_____

3. What did you find difficult to do? _____

_____

_____

4. How could you improve for next time? _____

_____

_____

5. What did you find most interesting about this experiment? _____

_____

_____

6. List any questions that you still have about the digestive process. _____

_____

_____

_____

_____