

GRADE 5: LESSON PLAN 1

ANATOMY: WHAT IS THE CONDUCTION SYSTEM?

Goals

- Students will understand the basic function of the heart's conduction system.
- Students will identify good and bad health behaviors and explain how they affect the heart.

Instructional objectives

Students will be able to

1. Identify the sinoatrial (SA) node.
2. Identify the atrioventricular (AV) node.
3. Identify the bundle of His.
4. Describe the basic function of the conduction system of the heart.
5. Discuss how the conduction system relates to a healthy heart.

Background information

The walls of the heart are a special kind of thick muscle known as cardiac muscle. The conduction system of the heart causes cardiac muscle to beat (contract and relax). Each heartbeat is a 2-step process that begins in a small group of neural cells located in the upper right atrium. This group of cells is called the sinoatrial (SA) node. The electrical impulse generated by the SA node causes the atrium to contract, pushing blood from the atrium into the ventricles. When the impulse reaches the area between the atrium and the ventricle, it is stopped briefly by the atrioventricular (AV) node. This brief stop in the electrical impulse gives the ventricle a moment to fill before contracting. The AV node determines when the ventricle needs to contract. As the impulse travels from the AV node through the wall of the ventricle, it follows a path of neural conductive tissue called the bundle of His. Each time this circuit is completed, the heart beats in two steps: first the atria contract, then the ventricles contract. The human heart may beat as many as 3 billion times during a lifetime and each beat is developed and controlled by the conduction system.

Materials

1. Colored pencils and scissors
2. Illustration: Conduction System (PDF from Look: Heart Anatomy)
3. Illustration: Anatomy of the Heart (PDF from Look: Heart Anatomy)
4. Worksheet: "My Heart's Electrical System" (Activity 5–A)
5. Worksheet: "The Conduction System in Action—A Flipbook Project" (Activity 5–B)
6. Optional: Classroom computer with Internet access
 - Project Heart, Look, Heart Anatomy: *Anatomy of the Heart with Descriptive Labels (Flash) and Anatomy of the Heart (Flash)*
 - Project Heart, Look, Heart Anatomy: *Conduction System of the Heart (Flash)*
7. Optional: Overhead projector for illustrations

Introduction

Begin the lesson by asking students to tell you about electricity. Remind them that electricity is responsible for making many things run such as lights, computers, and televisions. Lightning is nature's conduction system for the earth. Ask your students if they know that they have an electrical system of their own, in their bodies? Referring to the illustrations listed in Materials (PDF or Flash versions), show the conduction system. Trace the path of the electrical impulse in the heart, beginning in the SA node, moving to the AV node, and passing through the bundle of His.

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ANATOMY: WHAT IS THE CONDUCTION SYSTEM?

Discussion points

- Where does the electrical impulse begin?
- Where does the electrical impulse go?
- What does the electrical impulse do?

Lesson procedures/activities

1. Review the anatomy of the heart. Remind students the heart has 2 sides (right and left), 4 chambers, and 4 valves. Use the illustrations (PDF and Flash) in the Watch section of the Project Heart website.
2. Study the conduction system. Discuss how the heart is run by electricity generated in the SA node (the heart’s natural pacemaker). Discuss the AV node and its job as a “timer” or “gatekeeper” of the impulse before it is sent through the bundle of His to signal the ventricle to contract. Assign students the worksheet “My Heart’s Electrical System” (Activity 5–A).
3. Lightly touch on the subject of arrhythmias and what they are. An irregular heartbeat is known as an arrhythmia or heart rhythm disorder. The normal heart beats between 60 and 100 beats per minute. If the heart beats too slowly (less than 60 beats/minute), the arrhythmia is known as bradycardia, and if the heart beats too fast (greater than 100 beats/minute), the arrhythmia is known as tachycardia. In either case, people with an irregular heartbeat may feel dizzy or faint because they are not receiving adequate amounts of oxygen with each heartbeat. In some cases arrhythmias can be the result of heart damage. Bad habits such as smoking and drug use can damage the heart and increase the risk of heart disease. For example, the nicotine and other chemicals in cigarettes narrow the blood vessels and create irregularities in the timing of heartbeats.

Guided Practice

Ask students to draw their own interpretation of the heart’s electrical system and the heart in action. Suggest to the students that they draw an animated heart (flipbook) in different stages of electrical activity. Students should be able to trace the path of the electrical impulse from the SA node to the AV node and out through the bundle of His. (A second flipbook could address lightning traveling from cloud-to-ground during a storm.) Using the worksheet “The Conduction System in Action” (Activity 5–B) as a guide, provide students with instruction for drawing, labeling, and assembling the illustrations for the flipbook. Instructions are available at many sites on the Internet; for some ideas, see Additional Resources on the Grade 5 Activities webpage.

Independent practice

Ask students to write a short essay about why their heartbeat speeds up when they exercise. This assignment should determine content mastery of oxygen consumption by muscles (including the heart muscle) during exercise. Using the flipbook, demonstrate bradycardia and tachycardia by controlling the speed of flipping the pages. Hear slow and fast heartbeats at the Listen tab of the Project Heart website.

Adaptations

Students who have difficulty with writing may have their assignments adapted by allowing them to verbalize, demonstrate, or illustrate their responses.

Extension

Ask students to research why animals have different sized hearts; e.g., elephants have very large hearts that beat slowly, and birds have small hearts that beat very fast. For Internet research, see Suggested Links for website references.

Assessment

You may use observations of students during class activities and responses for written activities to determine their understanding of the lesson objectives.

Objective	Demonstrated lesson objective	Partially demonstrated lesson objective	Did not demonstrate understanding of the objective
Describe the anatomy of the conduction system.			
Describe the basic function of the conduction system.			
Discuss how the conduction system relates to a healthy heart.			

GRADE 5: LESSON PLAN 2

NUTRITION: WHY ARE VITAMINS AND MINERALS IMPORTANT?

Goals

Students will understand the role vitamins and minerals play in maintaining a healthy body and a strong heart.

Instructional objectives

Students will be able to

1. Differentiate between vitamins and minerals.
2. Understand the function of each type of vitamin and mineral.
3. Choose vitamin- and mineral-rich foods.

Background Information

The body needs 6 essential nutrients to grow and function: carbohydrates, protein, fat, water, vitamins, and minerals. Grade 4 Nutrition focused on the macronutrients: carbohydrates, protein, fat, and water. This lesson focuses on the micronutrients, the vitamins and minerals necessary for growth and maintenance of the body. Micro, a prefix meaning small, tells us the body only needs a small amount of each of the micronutrients to function.

Vitamins

Vitamins are micronutrients that contain carbon and come from living things. The body needs them for growth and metabolism (maintenance of body functions). Vitamins are either water soluble (dissolve in water) or fat soluble (dissolve in fat). The water-soluble vitamins, B and C, must be replaced each day because excess is flushed out of the body in the urine. There is only one vitamin C, but actually 8 different vitamin Bs, collectively known as the B vitamins or the B complex.

1. Vitamin B1 Thiamine
2. Vitamin B2 Riboflavin
3. Vitamin B3 Niacin
4. Vitamin B5 Pantothenic acid
5. Vitamin B6 Pyridoxine
6. Vitamin B9 Folic acid
7. Vitamin B12 Cobalamin or Cyanocobalamin
8. Vitamin H Biotin, considered a part of the B complex

The fat-soluble vitamins, A, D, E, and K, can be stored in the body and so do not need to be replenished every day.

Minerals

Minerals are inorganic substances that do not contain carbon as vitamins do, and they do not come from living organisms. Minerals are present in the earth, on the moon, and even on Mars (or other planets). Minerals, like vitamins, are considered micronutrients because the body only needs a small amount of each one to function properly. Minerals are categorized as either macrominerals or microminerals (also called trace minerals). The body needs larger amounts of the macrominerals than the microminerals. This lesson first addresses the macrominerals: calcium, phosphorus, magnesium, sodium and potassium. And then the microminerals or trace minerals: fluoride, iodine, iron, and zinc.

GRADE 5: LESSON PLAN 2

NUTRITION: WHY ARE VITAMINS AND MINERALS IMPORTANT?

Materials

1. Classroom and/or individual computer with Internet access:
 - MyPlate for kids: www.choosemyplate.gov/kids/
 - Internet resources for learning the vitamins and minerals
2. Student Resource: My Vitamin Dictionary
3. Student Resource: My Mineral Dictionary
4. Food labels
5. Worksheet: “Action Hero Flash Cards” (Activity 5–C)
6. Index cards (unlined)
7. Worksheet: “24-hour Nutrient Diary”/“Heart-Smart Student” certificate (Activity 5–D)
8. Worksheet: “Vitamin Fill-in-the-Blank” (Activity 5–E)
9. Worksheet: “Mineral Fill-in-the-Blank” (Activity 5–F)
10. Worksheet: “Vitamin Crossword Puzzle” (Activity 5–G)
11. Worksheet: “Mineral Crossword Puzzle” (Activity 5–H)
12. Teacher Resource: Answer Key

Introduction

Begin a class discussion of the teamwork concept. For example, choose a favorite local football or soccer team for reference. Explain that each member of the team has a very specific job. When each member performs his or her job at the right time, and in the right way, the team functions at an optimal level and is successful. Ask students to name the various players and their positions/roles on the team. Explain that some players on the team are big and powerful, while others are small and fast, but they all play equally important roles. Each member of the team has a particular athletic skill, but they need the right foods and physical conditioning to keep them at their peak. The same concepts apply in our bodies. If we have the right amount and balance of vitamin and minerals on our team, we function and grow. Each vitamin and mineral has a specific job to do to keep the body functioning properly. Just as with the sports team, vitamins and minerals must work together and with other nutrients to help the body achieve health and fitness.

Lesson procedures/activities

Human beings are very complicated and our bodies need a variety of nutrients to meet all nutritional demands. Good nutrition and a healthy lifestyle assist the body in using

each nutrient efficiently.

Explain to students the differences between vitamins and minerals. Vitamins are carbon-based, organic compounds that come from living things, and minerals are noncarbon-based, inorganic compounds that come from the earth.

Using the *My Vitamin Dictionary* and *My Mineral Dictionary* charts provided, and the *MyPlate* website, discuss each vitamin and mineral, why the body needs every one and what foods can supply them. Pay special attention to how vitamins and minerals support the heart (cardiovascular system, circulatory system, cardiac muscle, conduction system, the blood, and so on). Discuss the definitions of the terms enriched, fortified, RDA, and antioxidant.

Students can participate in the lesson by helping to locate or draw pictures of foods to associate each food with the vitamins and minerals it provides, and to identify its primary role in the body (for example: carrots, vitamin A, eyesight). Have a variety of food labels available to use as reference, but also include plenty of fresh foods in the discussion. (See References in the dictionaries for websites that list foods and their nutrients including vitamins and minerals.)

Guided Practice

Direct students in making flash cards of vitamin or mineral action heroes. (Refer to the worksheet for a template.) On the front of the card, students can draw the figure, and the hero’s nickname (for example, “The Excellent Dr. C”). On the back of the card, list or draw pictures of foods that are good sources of the nutrient, the proper name and letter designation of the vitamin or mineral, and its function in the body. When students have finished making several flash cards, have them present the information to the class, exchange (trade) the cards, or use them as flash cards to prepare for the interactive resources or other worksheets. Make this activity a fun way to help students learn the vitamins and minerals. Since students often find the B complex vitamins especially confusing, the flash cards may help by providing visual clues.

GRADE 5: LESSON PLAN 2

NUTRITION: WHY ARE VITAMINS AND MINERALS IMPORTANT?

Independent practice

Choose one nutrient from each of the following groups:

- fat-soluble vitamins
- water-soluble vitamins
- macrominerals
- microminerals

Ask students to keep a 24-hour food diary to track each of their chosen nutrients. In class the next day, discuss the nutrient levels on their food diaries. Determine whether they got the right amount of each vitamin or mineral they were tracking by comparing the diary to the appropriate dictionary entry for “How much do I need daily?” Ask them to explain which vitamin or mineral was the most heart-healthy and why. Have them suggest alternative foods that they would like to eat if their diet is lacking a particular vitamin or mineral.

Discuss how learning about the vitamins and minerals relates to good health and how that knowledge affects their ability to meet their bodies’ needs as they grow into adulthood.

Extension

Conduct an internet search or visit the NASA website (www.nasa.gov/externalflash/constellation_front/) and search for minerals found on the moon and/or other planets such as Mars. Are any of these minerals ones that are needed by the human body? Write a report or produce a PowerPoint presentation for the class discussing the topic.

Adaptations

Students who have difficulty writing or drawing may have their assignments adapted by allowing them to verbalize their responses or work with other students during guided and independent practice. Since the concept of teamwork is central to this lesson, adaptations should follow the same pattern.

Enrichment – Classroom Activity

Use the fill-in-the-blanks and crossword puzzle worksheets for vitamins and minerals as enrichment activities.

Assessment

Students’ understanding of the lesson objectives can be measured by observing them in group activities and by assessing their independent practice work.

Objective	Demonstrated lesson objective	Partially demonstrated lesson objective	Did not demonstrate understanding of the objective
Differentiate between vitamins and minerals	X		
Understand the function of each type of vitamin and mineral		X	
Choose vitamin- and mineral-rich foods	X		

GRADE 5: LESSON PLAN 3

EXERCISE: WHAT CAN I DO FOR MY HEART?

Goals

Students will understand the benefits of daily physical activity and learn the factors that affect physical performance.

Instructional objectives

Students will be able to

1. Relate ways that aerobic exercise strengthens and improves the efficiency of the heart and lungs.
2. Self-monitor heart rate during exercise.
3. Define the principles of frequency, intensity, and time, and describe how to incorporate these principles into their daily lives.

Background information

The heart muscle—like every other organ or tissue in the body—needs oxygen- and nutrient-rich blood to function. The heart pumps blood throughout the body to deliver oxygen and nutrients to the cells and to remove waste.

Cardiovascular exercise (aerobic, endurance) makes your heart beat faster, makes you breathe harder, and drives your body to use oxygen more efficiently.

Exercise is actually muscles contracting when nerves send electrical signals to the muscles. The contracting muscles use increased amounts of oxygen and nutrients (glucose) and release increased amounts of waste (carbon dioxide). This increased activity results in a higher demand for blood flow to the muscles. The heart muscle responds to exercise the same way other muscles do, increasing its consumption of oxygen and glucose. The heart muscle is also signaled by nerves to beat more frequently and forcefully. When the frequency and force of the contractions increase, the ventricles push more blood out of the heart and into the vessels, where it is carried to muscle cells throughout the body.

Strenuous exercise causes the cardiovascular system to respond by increasing the cardiac output (blood volume) to about 5 times the normal amount, which results in 20 times more blood flowing to the working muscles and less blood flowing to the inactive tissues. The body can efficiently adapt to changing needs of the muscles by delivering oxygen- and nutrient-rich blood to the areas of the body most in need. You might explain the reasoning behind the theory of not swimming immediately after eating. Blood leaves the extremities and goes to the body's core to assist the digestive system which results in less blood being directed to the arm and leg muscles which can cramp if they are not receiving enough oxygen and nutrients.

The lungs also work harder during exercise. The rate and depth of each breath increases to gather more oxygen and expel more carbon dioxide. All of this activity is good for the body; muscles that are used often grow stronger, the cardiovascular system becomes more efficient, and regular exercise lowers blood pressure because the blood vessels dilate.

Materials

Worksheet: "My Activity Journal" (Activity 5-I)

GRADE 5: LESSON PLAN 3

EXERCISE: WHAT CAN I DO FOR MY HEART?

Introduction

This lesson is about teaching students the life-long benefits of exercising to improve their cardiovascular system. Parents, teachers, and friends have the ability to encourage and motivate children to be active and continue a healthy level of activity throughout life. The President's Council on Physical Fitness and Sports research digest suggests that at about age 10, children begin to become competitive. Students who believe they are physically competent are more likely to enjoy activity and remain interested in physical activity into adulthood. To begin the process of developing an intrinsic desire to be physically active, we must first make physical activity enjoyable and fun and then keep them motivated. Self esteem is directly related to positive experiences with physical activity and exercise. Activities that students participate in must be more fun and appealing than alternative unhealthy activities. It is up to us to motivate the next generation to be physically fit and heart healthy.

Lesson procedures/activities

1. Begin the lesson with a review of what happens in the body when we exercise. Ask students to define aerobic exercise and give examples. During the discussion make a list of every kind of aerobic exercise they mention. Make two lists on the board: one list of activities that can be done individually and another list for group activities. For example, dance vs. play softball. Talk about where and when you can do the activity and whether you need a partner, team, or group. Have students pick their top 3 favorites and write them down.
2. Review the method of checking the pulse at the carotid artery. (See Grade 3, activity 4–I.) Demonstrate checking the pulse before exercising (while resting). Explain that the increase in pulse they detect after exercising demonstrates that the heart is working harder (the heart is exercising too).

You can find your pulse in 2 places: at the base of your thumb on either hand (called the radial pulse), or at the side of your neck (called the carotid pulse). Put your first 2 fingers over your pulse and count the number of beats within a 10-second period. (It helps to have a buddy time the 10 seconds.) Multiply this number by 6 and you will have the number of heartbeats in a minute. For example,

if you counted your pulse to be 20 during the 10-second pulse count, your heart rate would be 120 beats per minute.

3. Discuss the principles of cardiovascular exercise:

Frequency	how often one exercises
Intensity	how hard one exercises
Time	how long one exercises

Remind students that cardiovascular health depends on consistency. They must consistently eat a well balanced diet, and consistently participate in physical activities to stay healthy and physically FIT.

4. Explain to students that they are beginning a week-long activity designed to help them determine their preferences and impressions of different types of physical activity. This week-long activity can be done during recess to ensure participation and group motivation. Plan 2 days for group activities and 3 days for individual activities to add variety and divide the schedule during the week. Begin by giving them the worksheet: *My Activity Journal*. Explain that they will be choosing several physical activities, and trying them on different days during the week. Students will record the amount of time they participated in each activity, and what their heart rate was after about 20 minutes. They should also decide whether the activity can be considered helpful to the cardiovascular system (it made their heart work harder) and what muscle groups were exercised during each of the activities. (For example, are their legs tired or their arms sore?) Also, students should state on the worksheet if they liked the activity well enough to make it a part of their regular routine. To ensure that students are interested in succeeding, ask them to think creatively about methods to keep themselves and each other motivated.
5. *Group Activity* From the *list of group activities*, choose several activities and ask students to pick their favorite. Divide the students according to their choices. Have them strategize as a group to address motivation, and adding fun to the activity. For example the speed walkers could write a cadence to recite while walking to keep them on time and in step. Groups could also make up new games to play while participating in their activity. For example the basketball players could think

GRADE 5: LESSON PLAN 3

EXERCISE: WHAT CAN I DO FOR MY HEART?

up new and fun rules for the game to keep it interesting. Ask each group to present their plan for adding fun and motivation for their chosen activity to the class. Explain to students they will be participating in this activity two times during the activity week.

6. *Individual Activity* From the list of individual activities, have students choose several they are going to perform. Encourage them to think about activities that can be done inside or out, in a big space or small. Ask them to find ways to make each activity fun so they are motivated to continue.
7. *Conclusion* At the end of the activities week, evaluate the results of the worksheet. Discuss which activities they liked best, and whether they would likely continue them and why. Review the value of each activity: heart rate, what muscle groups they used, and whether they considered it a good cardiovascular (aerobic) exercise. Ask students if they feel different after a week of added activity. Are they more energetic? less tired? and do they have a different attitude about physical activity or life in general?

Independent practice

Ask students to research age-appropriate frequency, intensity, and time recommendations for children in their age group and write a report on the results. The report should also include an overview of why cardiovascular health is important to them now and when they become adults.

Adaptations

For those students who are physically challenged and can't walk, plan to have a parent volunteer or classroom aide available to assist with alternative exercises that the students can perform.

Extension

For those students motivated to learn more, ask them to research physical activity recommendations for each member of their family and design a week-long family activity chart. At the end of the week ask family members to comment on the activity both from a health and family fun perspective.

Assessment

Objective	Demonstrated lesson objective	Partially demonstrated lesson objective	Did not demonstrate understanding of the objective
Relate ways that aerobic exercise strengthens and improves the efficiency of the heart and lungs	X		
Self-monitor heart rate during exercise		X	
Define the principles of frequency, intensity, and time and describe how to incorporate these principles into daily life			X

GRADE 5: LESSON PLAN ACTIVITY MASTERS

- 5–A Anatomy: My Heart’s Electrical System (worksheet)
- 5–B Anatomy: The Conduction System in Action—A Flipbook Project (worksheet)
- 5–C Nutrition: “Action Hero Flash Cards” (worksheet)
- 5–D Nutrition: “24-hour Nutrient Diary” (worksheet)
Heart-Smart Student certificate
- 5–E Nutrition: “Vitamin Fill-in-the-Blank” (worksheet)
- 5–F Nutrition: “Mineral Fill-in-the-Blank” (worksheet)
- 5–G Nutrition: “Vitamin Crossword Puzzle” (worksheet)
- 5–H Nutrition: “Mineral Crossword Puzzle” (worksheet)
- 5–I Exercise: “My Activity Journal” (worksheet)

Additional Resources

Student Resource

- My Vitamin Dictionary
- My Mineral Dictionary

Teacher Resource

- Answer Key

From the Project Heart website

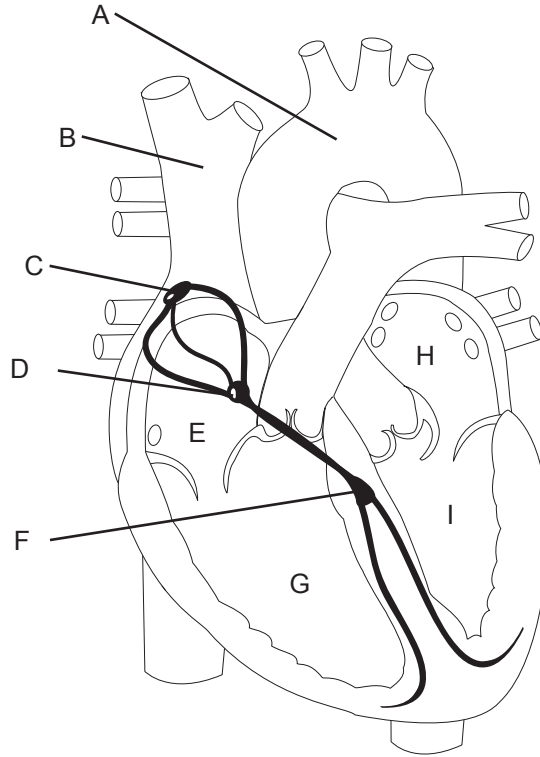
- Alliance for a Healthier Generation
- CDC Department of Nutrition and Physical Activity
- Healthy Kids Challenge
- Powerful Girls have Powerful Bones
- We Can!
- Website resources for making flipbooks and other animations:
 - Flipbook examples and a template based on an Amy Tan storybook
pbskids.org/sagwa/color/flipbook/index.html
 - Animation overview and instructions for flipbooks and other techniques
youthlearn.org/learning/activities/multimedia/
 - A simple flip book illustrated and explained
www.shmonster.com/old_site/Flip_Book.html
 - Flipbook instructions from the National Gallery of Art
www.nga.gov/kids/stella/activityflip.htm#sequence

Project Heart

Activities for the Classroom

Identify each labelled part of the heart. In the corresponding blank, define its function.

ANATOMY MY HEART'S ELECTRICAL SYSTEM



Identify:

- A. _____
- B. _____
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____
- H. _____
- I. _____

Define:

- A. _____
- B. _____
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____
- H. _____
- I. _____

Create a flipbook that illustrates the path of the conduction system.

Use this page for the cover and the next page for the insert. (Use as many copies of the second page as necessary.)

ANATOMY

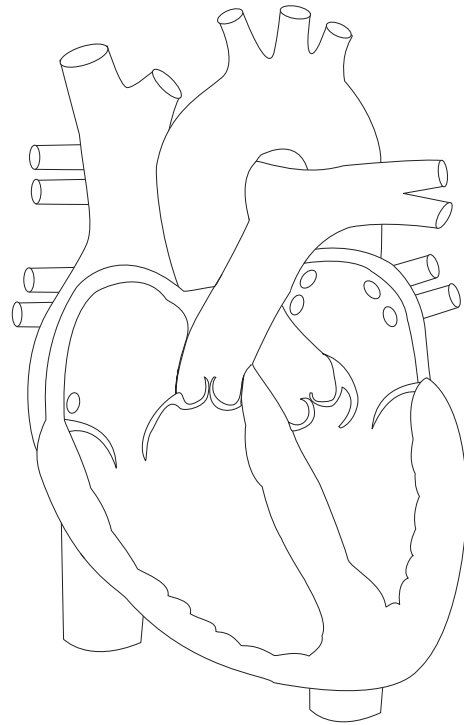
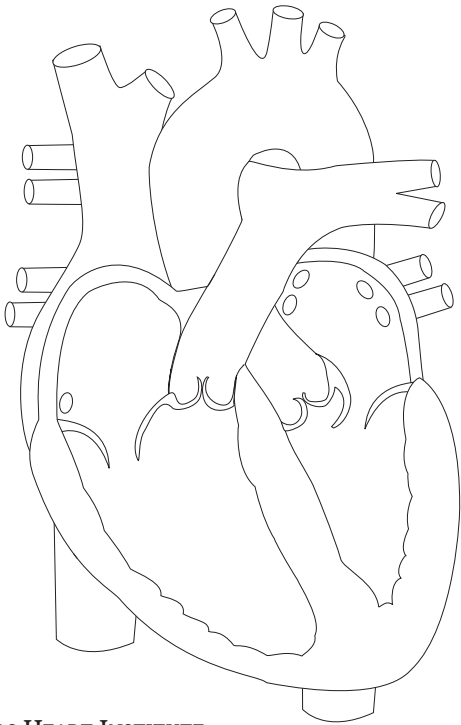
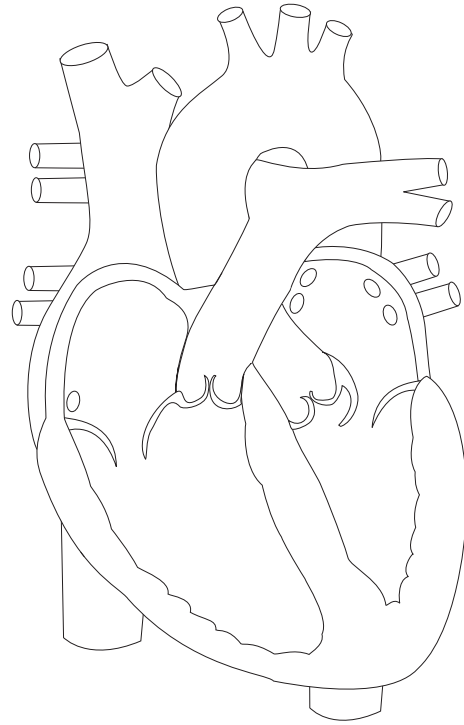
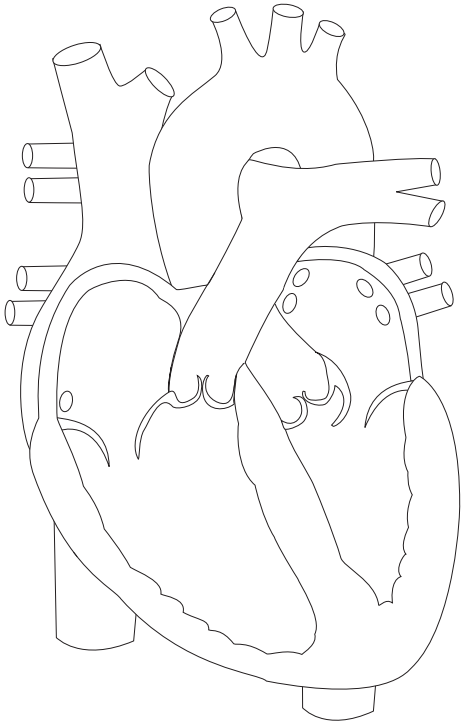
THE CONDUCTION SYSTEM FLIPBOOK

The Conduction System in Action A Flipbook Project

By: _____

Project Heart

Activities for the Classroom



Project Heart

Activities for the Classroom

Using index cards or this template, create a series of flash cards.

On the front of the card (top square), draw an action figure and label with the hero's nickname.

On the back of the card, (bottom square) write the proper name and letter of the vitamin or mineral, its function in the body, the names of foods that are good sources of the nutrient, how much you need, and other interesting facts. Sign your work with your initials.

If you used the template, cut on the dashed lines, fold in half and seal.

NUTRITION ACTION HERO FLASH CARDS

Action Hero

Secret identity (full name of vitamin or mineral) _____

Mission (role in the body) _____

Hideout (where you can find it) _____

Secret code (how much you need daily) _____

Stats (facts and figures) _____

Your initials _____

Project Heart
Activities for the Classroom

Use this worksheet for one day to track the amount of vitamins and minerals in your diet.

Challenge: Use the diary everyday for one week. When the week is over, turn your list in to your teacher and earn a Heart Smart certificate from the Texas Heart Institute.

NUTRITION

24-HOUR NUTRIENT DIARY

Date _____

My fat-soluble vitamin is _____ (Example: Vitamin A)

Source of Fat-soluble Vitamin

Example: Carrots			
Serving size (indicate tsp, TBSP; cup, etc.)	1/2 cup		
Number of servings	2		

My water-soluble vitamin is _____ (Example: Vitamin B1)

Source of Water-soluble Vitamin

Example: Cereal			
Serving size (indicate tsp, TBSP; cup, etc.)	3/4 cup		
Number of servings	2		

My macromineral is _____ (Example: Magnesium)

Source of Macromineral

Example: Kiwi			
Serving size (indicate tsp, TBSP; cup, etc.)	1/4 cup		
Number of servings	1		

My micromineral is _____ (Example: Iodine)

Source of Micromineral

Example: Garlic			
Serving size (indicate tsp, TBSP; cup, etc.)	1/4 tsp		
Number of servings	1		

Use your Vitamin Dictionary to help you complete these sentences.

NUTRITION

FILL-IN-THE-BLANK: VITAMINS

1. A, D, E, and K are _____* soluble vitamins; the body can store them so they do not need to be replenished every day.
2. _____* are substances that contain carbon and come from living things.
3. Vitamin B is usually referred to as B complex because there are _____*E different B vitamins.
4. B and C are _____* soluble vitamins; the body does not store them and they must be replenished each day.
5. Vitamin ____ can be made by the body from beta-carotene found in brightly colored fruits and vegetables such as carrots, cantaloupe, and sweet potatoes.
6. Vitamin ____ is important for maintaining healthy vision so we can react to changes in light and distinguish between different colors.
7. Vitamin ____ can be found in enriched bread products and whole grains. It helps the body produce energy from carbohydrates.
8. Good sources of vitamin ____ are the sun, fortified milk, cod liver oil, eggs, or salmon.
9. The _____* vitamins have many roles in the body; two of the most important roles are to help produce energy from carbohydrates and break down fats and proteins.
10. Vitamin ____ can be found in citrus fruits, potatoes, strawberries, tomatoes, kiwi, broccoli, spinach, and other leafy greens.
11. Vitamin K is needed for _____* and good sources are green leafy vegetables, vegetable oils such as soybean and canola, and green tea.
12. Vitamin ____ helps the body maintain calcium and phosphorous (minerals) at healthy levels to help the nervous and immune systems.

Use your Mineral Dictionary to help you complete these sentences.

NUTRITION

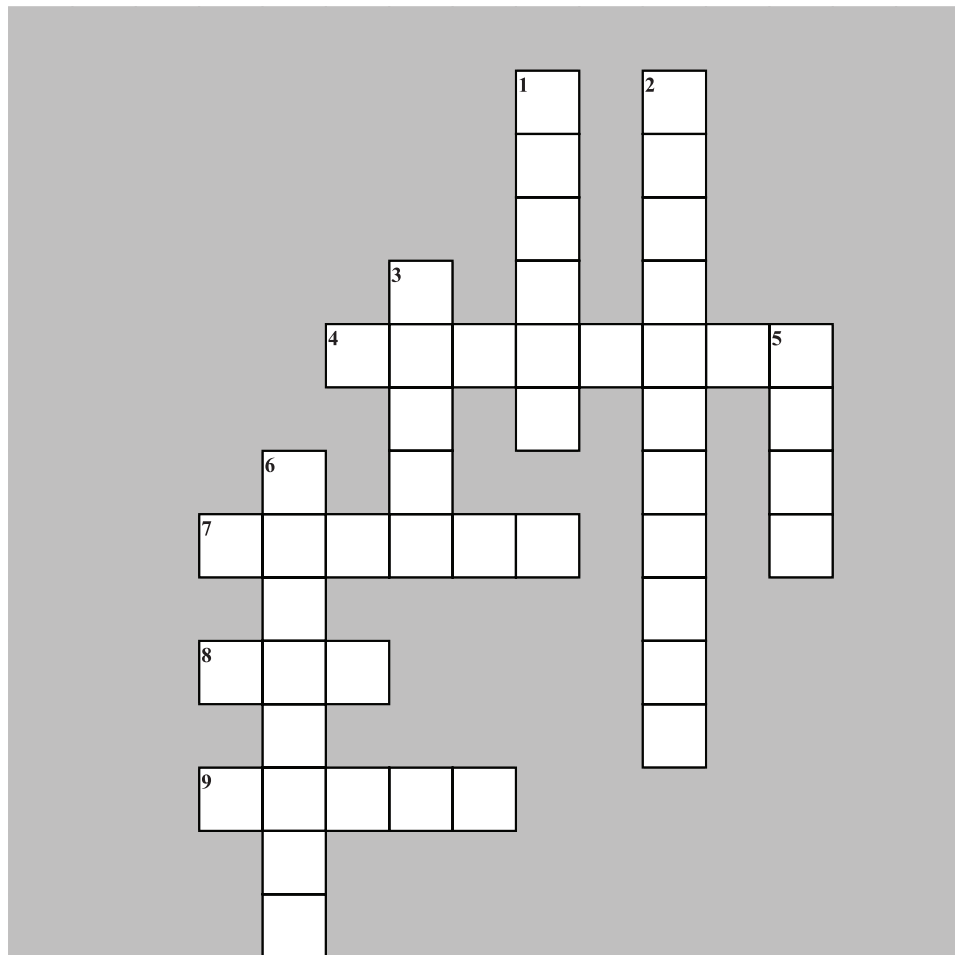
FILL-IN-THE-BLANK: MINERALS

1. _____ is the most abundant mineral in the body and it's vital for building strong teeth.
2. Red meat and beans are good sources for _____, an abundant trace mineral that helps the immune system.
3. Too little _____ can cause anemia but too much can cause problems too.
4. Table salt can be plain, or with _____, a micromineral.
5. Legumes, pumpkins, and avocados all contain _____, a major mineral especially important to the heart.
6. A partner with calcium, _____ reduces muscle pain after vigorous exercise.
7. The macromineral called _____, or sodium chloride helps to regulate fluids, including blood volume.
8. Good sources of _____ are fresh fruits and dried fruits as well as green leafy vegetables.
9. Microminerals (also called _____ minerals) are necessary for the body but in smaller amounts.
10. Foods can be _____ to ensure they provide adequate levels of essential nutrients.
11. Public drinking water and toothpaste contain _____ to help prevent cavities even though it is not an essential mineral.
12. A _____ is an inflammation of the thyroid gland that can be caused by a lack of iodine in the diet.

Use your Vitamin Dictionary to help you solve the puzzle.

NUTRITION

CROSSWORD PUZZLE: VITAMINS



Across

- 4 Vitamin A can be made by the body from beta-_____.
- 7 Vitamin C can be found in _____ fruits.
- 8 A, D, E, and K are _____ - soluble vitamins that the body can store.
- 9 The B complex contains _____ different vitamins.

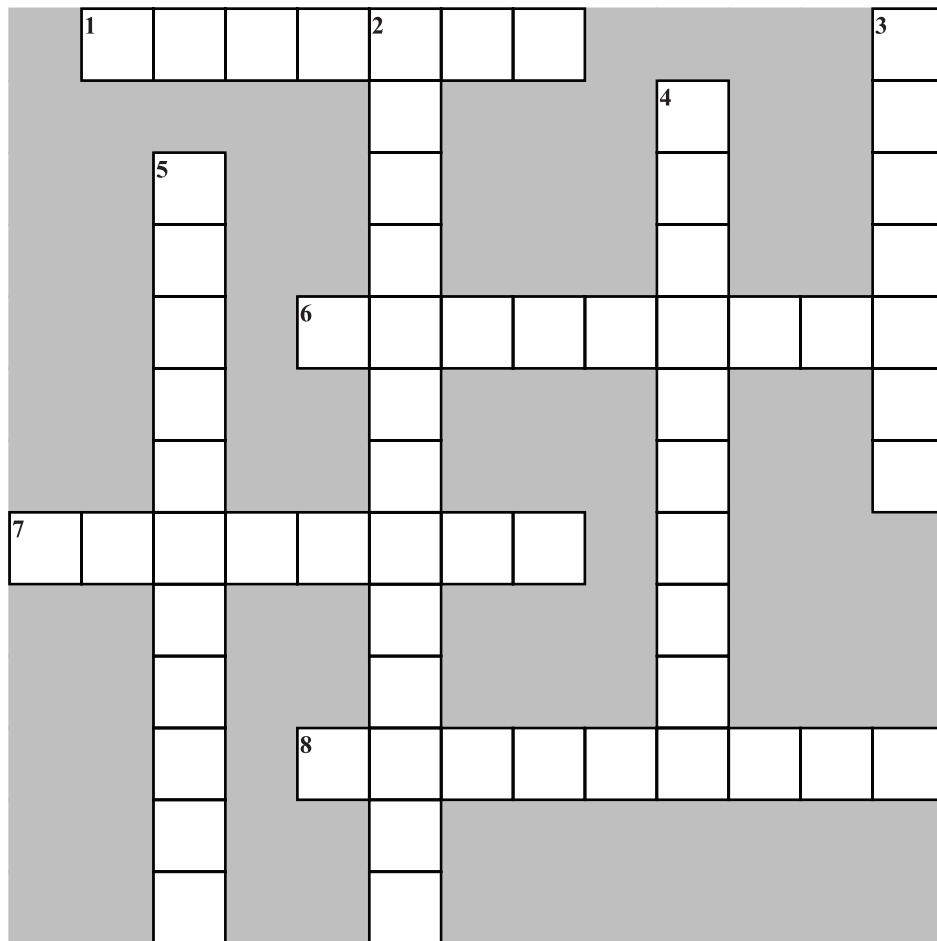
Down

- 1 Vitamin A is important for maintaining healthy _____.
- 2 A good source of vitamin B (two words).
- 3 B and C are _____ - soluble vitamins that the body must replenish each day.
- 5 A good source of vitamin D.
- 6 Substances that contain carbon and come from living things.

Use your Mineral Dictionary to help you solve the puzzle.

NUTRITION

CROSSWORD PUZZLE: MINERALS



Across

- 1 Good sources of magnesium that help the heart maintain a natural rhythm.
- 6 This mineral is found in bananas and green leafy vegetables
- 7 Iodine is essential for producing _____.
- 8 A lack of _____ can cause irritability, muscle spasms, and abnormal heart rhythms.

Down

- 2 Flouride, iodine, iron and zinc.
- 3 Complex proteins that act on other chemicals in the body to speed up processes like digestion.
- 4 This abundant mineral helps the kidneys to filter waste.
- 5 Too little sodium can lead to this fluid imbalance.

EXERCISE

MY ACTIVITY JOURNAL

Activity	Date	Length of time	Heart rate (after 20 min)	Aerobic exercise?	Muscle groups used most
1					
2					
3					
4					
5					

	Activity	Type
1:	_____	<input type="checkbox"/> Individual <input type="checkbox"/> Group
2:	_____	<input type="checkbox"/> Individual <input type="checkbox"/> Group
3:	_____	<input type="checkbox"/> Individual <input type="checkbox"/> Group
4:	_____	<input type="checkbox"/> Individual <input type="checkbox"/> Group
5:	_____	<input type="checkbox"/> Individual <input type="checkbox"/> Group

Which activities would you enjoy doing again? Why?

What would help motivate you to continue these activities?

NUTRITION

TEACHER RESOURCE: ANSWER KEY

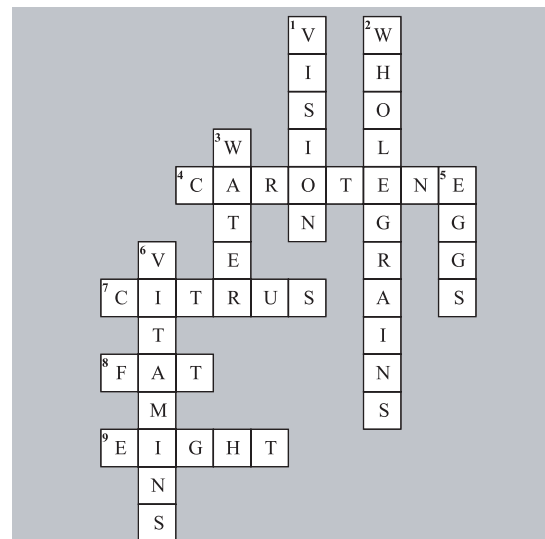
Fill-in-the-Blank: Vitamins (5–E)

1. fat
2. vitamins
3. 8 (eight)
4. water
5. A
6. A
7. B
8. D
9. B complex
10. C
11. blood clotting
12. D

Fill-in-the-Blank: Minerals (5–F)

1. calcium
2. zinc
3. iron
4. iodine
5. magnesium
6. phosphorus
7. salt, sodium, or sodium chloride
8. potassium
9. trace
10. fortified
11. fluoride
12. goiter

Crossword Puzzle: Vitamins (5–G)



Crossword Puzzle: Minerals (5–H)

