

Human Body Systems

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This unit is designed to support delivery of the WW-PRSD science curriculum entitled The Human Body Systems and the third grade health curriculum. Please review the curricula for all enduring understandings, essential questions, etc. The lessons are designed to meet curriculum and state standards for science and health. After the pilot year of 2012-13, please be prepared to share any additional resources and lesson enhancements as well as your evaluation of lessons/resources in this document. We would also like to evaluate final assessments to determine the effectiveness of the unit.

Lesson 1: Introduction to Human Body Systems

Objective: Understand that the human body consists of a number of systems that work together to help us survive

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.1
5.3.4.A.3

Procedures:

1. KWL (Know, Want to Know, Learned chart) on the Human Body and its systems
2. Questions to ask: What do living things need to survive?
Possible answers - food/nutrients, oxygen, way to continue the species, habitat, etc.
3. What do humans need to survive? Is it different for human beings?
Possible answers - food/nutrients, oxygen, way to continue the species, habitat, etc.
4. What is a body system?
A body system is a group of body parts that work together to perform a function for your body.
5. Set up a binder/folder for the unit (teacher choice)
6. Optional:
 - a. Create one life-size figure (child) paper outline to use throughout the unit, posted in the room. This will give a visual overlay of each system studied.
 - b. Alternately, each child could be given a scale outline (9x12) to depict key systems/organs.

Resources:

- a. Human Body Reproducible Guide (Kit)
- b. The Body Book: *Easy-to-Make Hands-on Models That Teach* (Kit)
- c. Magic School Bus Human Body DVD, Scholastic (Library)
- d. Complete Book of the Human Body (Classroom)
- e. Human Body Education Posters (Classroom)
- f. Learning Resources Anatomy Models (Kit)
- g. Human Body System Pictures:
http://science.nationalgeographic.com/science/photos/heart/#/heart-monitor_987_600x450.jpg

Lesson 2: Systems Overview

Objective: To gain an overview of the following systems:

- Nervous
- Circulatory
- Respiratory
- Digestive/Excretory
- Skeletal
- Muscular
- Reproductive (as it applies to human life cycle)

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.3

Procedures:

1. Read the book or show the video Magic School Bus Inside the Human Body

Resources:

- a. The Magic School Bus Inside the Human Body DVD, (Library)
- b. The Magic School Bus Inside the Human Body Book, (Kit)

Lesson 3: Senses Overview

Objectives:

- Identify the five senses, how they function and why they are important to our survival
- Utilize the senses to improve observational and recording skills

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.3

Procedures:

1. Class brainstorm and list all senses
2. Discuss importance of each sense, how they function and how they help us survive.
3. Possible Hands-On Activities: (Note: these can be done prior to starting the unit, as a mini-unit at the beginning of the year, or during the unit over several days; there is some set up time involved for each of these; Food/Allergy Event Permission Slip needs to be utilized for items D & E)
 - a. Touch: Sandpaper Rankings; Fishing Line exp.
 - b. Sound/Hearing: Sound location exp.
 - c. Sight: Optical illusion website; Franklin Institute Pupil dilation activity:
http://www.fi.edu/learn/heart/enrichment/activity_light-shine-in.html (Best suited set up in computer lab.)
 - d. Smell: Sight/Smell relationships
 - e. Taste: Jellybean explorations; Tongue Mapping

Resources:

- a. Handouts
- b. Magic School Bus Explores the Senses/Comes to Its Senses, Scholastic (Library)
- c. BrainPop, Jr., Senses movie and activities:
www.brainpopjr.com/health

Lesson 4: The Nervous System

Objectives:

- Identify and explain the major parts of the nervous system and what they do
- Identify and explain the flow and function of the system

Standards:

- Health - 2.3.4.B.4
- Science - 5.3.4.A.2
5.3.4.A.3

Procedures:

1. Name major parts of the nervous system
 - a. Brain
 - b. Spinal Cord
 - c. Nerves
 - d. Sensory Organs (lesson 3)
 - e. Identify connections with the other body systems
2. Identify the flow and function of the system
Purpose of system: to transmit information from the brain to the body and from the body to the brain.
3. Identify the three main parts of the brain
 - a. Cerebrum
 - b. Cerebellum
 - c. Brain Stem
 - Memory game - Optional Activity
4. Briefly describe the Spinal Cord
 - a. Give examples of other species spinal cords
5. Briefly describe nerves and how they work
 - a. Dominoes or another method to show how they work
6. Explore Reflex Action

Resources:

- a. Handouts
- b. The Brain: Our Nervous System by Seymour Simon
- c. KidsHealth in the Classroom; Brain/Nervous System movie and activities:
http://kidshealth.org/kid/htbw/htbw_main_page.html
- d. Brain teacher resource:
http://www.fi.edu/learn/heart/enrichment/activity_watch-the-brain-learn.html
- e. Model brain

Lesson 5: Effects of Drugs and Alcohol on the Nervous System

Objective: Identify and explain the harmful effects of drugs and alcohol on the nervous system

Standards:

- Health - 2.3.4.B.4
- Science - 5.3.4.A.3

Procedures:

1. Review the flow and function of the nervous system
Purpose of system: to transmit information from the brain to the body and from the body to the brain.
2. Identify harmful effects on the nervous system
 - a. Drugs -
 - i. Helpful vs. Harmful
 - ii. Effects on the body
 - iii. How to say "No"
 - b. Alcohol - Effects on the body

Resources:

- a. Handouts
- b. The Brain: Our Nervous System by Seymour Simon
- c. BrainPop, Jr. movie and activities on Senses:
www.brainpopjr.com/health
- d. Model brain
- e. "Yoo Hoo" video - PSE&G & Co. (1988) VHS - Library

Lessons 6: The Circulatory System (Part A)

Objective: Identify and explain the major parts of the circulatory system

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.2
5.3.4.A.3

Procedures:

1. Name major parts of the circulatory system:
 - a. Organs: heart, veins, arteries
 - b. Blood - including red and white cells,
 - c. Identify connections with the other body systems
2. Identify the flow and function of the system:
 - a. Transports oxygen and nutrients to other parts of the body
 - b. Transports CO² and wastes from other parts of the body
 - c. Transports heat to other parts of the body
 - d. Includes cells that fight infection

Resources:

- a. Handouts
- b. The HEART A mighty Pump, Marsh Media, (Library)
- c. A Healthy Me Teacher Resource
<http://www.ahealthyme.com/> Teacher Resource
- d. Evolution of the Human Heart (teacher resource)
<http://evolution.about.com/od/humans/a/Evolution-of-the-human-heart.htm?p=1>
- e. Model heart

Extension Activity:

- a. How Big is Your Heart? Compare size of the human heart (size of your fist) to animal hearts (worm, fish, frog, bird)

Note - Coronary Diseases and Blood Pressure will be discussed in Nutrition and Exercise lessons.

Lessons 7: The Circulatory System (Part B)

Objective: Find and use pulse to follow the flow of the circulatory system

Standards:

- Health -2.1.4.A.2
- Science - 5.3.4.A.3

Procedures:

1. Review the flow and function of the circulatory system
2. Learn what the pulse is and how to take it
3. Use a stethoscope properly to listen to heartbeat or find pulse in wrist (two fingers on right hand, put it on top of your left thumb, slide it down to the groove in your wrist, press firmly to feel pulse); do jumping jacks (or other aerobic activity) and listen again; identify the differences; discuss changes; possible extension: make table and graph changes in heartbeat

Resources:

- a. Handouts
- b. Stethoscopes (2 classroom sets per school - Nurse/GLL)
- c. Model heart

Lesson 8: The Respiratory System (Part A)

Objective: Identify and explain the major parts of the respiratory system

Standards:

- Health - 2.1.4.A.2
2.3.4.B.2
- Science -5.3.4.A.3

Procedures:

1. Name major parts of the respiratory system (show Bill Nye DVD):
 - a. Mouth
 - b. Nose
 - c. Trachea
 - d. Lungs
 - e. Diaphragm
2. Identify the flow and function of the system
 - a. Provides oxygen for the body
 - b. Removes carbon dioxide from the body
3. Identify connections with the other body systems, particularly the circulatory system
4. Resources:
 - a. Handouts
 - b. Bill Nye DVD: Respiration (Library)
 - c. Respiratory System in Other Animals:
http://www.lung.ca/children/grades4_6/respiratory/index.html
 - d. KidsHealth in the Classroom; Respiratory movie and activities:
http://kidshealth.org/kid/htbw/htbw_main_page.html
 - e. BrainPop, Jr. movie and activities on Senses:
www.brainpopjr.com/health
 - f. Model Lung

Lesson 9: The Respiratory System (Part B)

Objective: Review major parts of the respiratory system and how lungs work

Standards:

- Health - 2.1.4.A.2
2.3.4.B.2
- Science - 5.3.4.A.2
5.3.4.A.3

Procedures:

1. Review the flow and function of the system (show Puff of Air video)
2. Make a model of the human lungs/diaphragm:
<http://www.adprima.com/sci-respsystem.htm>
3. Discuss how the model demonstrates how the lungs work

Resources:

- a. Handouts
- b. Respiratory - A Puff of Air, Marshmedia, (Library)
- c. KidsHealth in the Classroom
www.Kidshealth.org/kid/body/lung_noSW.html
- d. BrainPop, Jr.; Lungs movie and activities:
www.brainpopjr.com/health

Lesson 10: The Respiratory System (Part C)

Objective: Identify the harmful effects of smoking on the respiratory system and the other body systems

Standards:

- Health - 2.1.4.A.2
2.3.4.B.2
2.3.4.B.3
- Science - 5.3.4.A.2
5.3.4.A.3

Procedure:

1. Question: Why is it bad to smoke?
 - a. Effects of nicotine include: raises heart rate, thickens walls of blood vessels, causes loss of flexibility in lungs, heart, and blood vessels, makes it harder for lungs and heart to contract, etc.
 - b. Effects of carbon monoxide in blood include: poisons various systems
 - c. Effects of tar include: reduces flexibility in lungs, heart, and blood vessels, reduces oxygen flow from lungs to the rest of the body.
2. Why do people do it?
 - a. Peer pressure
 - b. To be cool/different
 - c. Some people find it relaxing
3. Whom does it harm?
 - a. Other people in the room breathe in second hand smoke
 - b. Unborn babies of mothers who smoke
 - c. The smoker
4. What is a cigarette?
 - a. Tobacco (a plant) with chemical additives (primarily nicotine), rolled in paper
5. Why shouldn't you smoke?
 - a. Bad for your lungs, heart, and all other systems
 - b. Cost
 - c. Smell on clothing, body, and breath
 - d. Discolors teeth, and reduces taste and smell
 - e. Causes cough and sore throat
 - f. Pollutes the air and causes fires
 - g. Harms anyone subject to second hand smoke

6. Question: "What will you say if someone asks you to smoke?"

7. Distribute anti-smoking materials

Resources:

- a. Handouts
- b. KidsHealth in the Classroom
www.Kidshealth.org/kid/stay_healthy/body/smoking.html
- c. American Cancer Society: <http://cancer.org> - for a pamphlets on smoking
- d. BrainPop, Jr.; Smoking movie and activities:
www.brainpopjr.com/health

Lesson 11: The Digestive System

Objective: Identify and explain the major parts of the digestive system

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.3

Procedures:

1. Name major parts of the digestive system (Note: skipping liver, gallbladder, and pancreas):
 - a. mouth and teeth
 - b. esophagus
 - c. stomach
 - d. small and large intestines
 - e. rectum and anus
2. Identify the flow and function of the system:
Breaks down food into chemicals the body can use
3. Identify the connection between the digestive and other body systems, particularly the circulatory system
4. Possible Hands-On Activity:
 - a. Conversion of Starch to Sugar in the Mouth (Note: Food/Allergy Event Permission Slip needs to be utilized)

Resources:

- a. Handouts
- b. Bill Nye DVD: Digestion (Library)
- c. Digestive: The Disappearing Dinner, Marshmedia (Library)
- d. Digestive System Kinesthetic lesson:
http://www.accessexcellence.org/AE/AEC/AEF/1995/cave_digest.php
- e. Interactive digestive system:
<http://www.ahealthyme.com/topic/digestivesystem>
- f. BrainPop, Jr.; Digestive System movie and activities:
www.brainpopjr.com/health
- g. KidsHealth in the Classroom; Brain/Nervous System movie and activities:
http://kidshealth.org/kid/htbw/htbw_main_page.html

Lesson 12: The Skeletal System

Objective: Identify and explain the major parts of the skeletal system

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.2
5.3.4.A.3

Procedures:

1. How many bones does the skeletal system have? (206 as an adult, babies are born with more bones then they fuse together)
 - a. Name major parts of the skeletal system:
 - i. Bones: cranium, spinal column, clavicle, scapula, sternum, ribs, radius, pelvis, patella, and tibia
2. How are the bones connected to one another?
 - a. Joints and ligaments are tough tissues
 - b. Major joints are hips, knees, ankles, toes, shoulder, elbow, wrist, and fingers
3. Identify the function of the system:
 - a. Gives the body shape
 - b. Provides protection for the organs
4. Comparison to other animals (use the internet to acquire skeletons, x-rays, exoskeletons that illustrate different skeletal systems)
 - a. Skeletons to skeletons
 - b. Skeletons to exoskeletons
 - c. Show actual x-rays
5. Show Bones and Muscles: A Team To Depend On

Resources:

- a. Handouts
- b. Bones and Muscles: A Team To Depend On, Marshmedia (Library)
- c. KidsHealth in the Classroom
http://kidshealth.org/kid/body/bones_noSW.html
- d. BrainPop, Jr.; Bones movie and activities:
www.brainpopjr.com/health
- e. Model Skeleton

Lesson 13: The Muscular System

Objective: Identify and explain the major parts of the muscular system

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.2
5.3.4.A.3

Procedures:

1. Show Magic Bus Flexes Its Muscles DVD/Video
2. Identify the function of the system:
Muscles provide structure, strength, and movement for the body.
3. How many muscles are in your body? (over 650 muscles)
Name major types of muscles
 - a. Skeletal - (e.g. triceps, biceps)
 - b. Smooth - organ muscles (e.g. diaphragm)
 - c. Cardiac - heart
4. How do your muscles work?
 - a. Muscles work together in pairs (one gets shorter and pulls, the other muscle pulls the bone back)
 - b. Identify the difference between voluntary and involuntary muscles
5. How are the muscles attached to the bones?
 - a. Tendons - as the muscles contract, tendons pull the bones and make them move
 - b. Muscles are a thicker consistency, while the tendons are a thinner more rubbery band

Resources:

- a. Handouts
- b. Magic School Bus: Flexes Its Muscles DVD/Video, Scholastic, (Library)
- c. BrainPop, Jr.; Muscular System movie and activities:
www.brainpopjr.com/health
- d. KidsHealth in the Classroom; Muscular System movie and activities:
http://kidshealth.org/kid/htbw/htbw_main_page.html

Lesson 14: Human Life Cycle

Objective: Identify the stages of the human life cycle and compare to the life cycles of other living things

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.2
5.3.4.A.3

Procedures:

1. Identify the stages of the Human Life Cycle; (include some key milestones of each stage)
 - a. Birth: The baby enters the world
 - b. Infancy: (0-12 months) The body functions (e.g. heartbeat, breathing, etc.) occur without the assistance of a mother, but the child is wholly dependent on another for survival
 - c. Childhood:
 - i. (1 - 3 years = toddler) Toddlers learn to walk, talk and become more self-sufficient
 - ii. (Approx. 3 -11 years = childhood) These skills continue to develop as the child matures
 - d. Adolescence: (Approx. 12 - 18 years) a time when a person undergoes many physical, emotional and intellectual changes; a time to prepare for adulthood
 - e. Adulthood: (18+) The period that lasts from the end of adolescence to advanced adulthood; people become more independent and may start their own family
 - f. Advanced Adulthood: (variable) The last part of adulthood prior to death
2. Watch the video All About the Human Life Cycle
3. Compares and contrasts one's own stage of life with siblings and/or parents. (Venn Diagram)
4. Compare and contrast with life cycles of other living things
 - a. Have the students connect to what they learned in 1st and 2nd grade science units: Organisms and Insects

Resources:

- a. All About the Human Life Cycle, Schlessinger, DVD (Library)
- b. WW-P Teacher Website under 2nd grade Health - teacher created video on Human Life Cycle

Lesson 15: Nutrition

Objective: Identify and explain how nutrition effects the human body

Standards:

- Health - 2.1.4.A.2
- Science - 5.3.4.A.3

Procedures:

1. What do you have to do to keep the human body in good working order?
 - a. Diet and exercise
2. What are the major food groups?
 - a. Grains, fruits, vegetables, milk, meats/beans, and fats/oils
3. What is in the food that keeps us healthy?
 - b. Carbohydrates, protein, fat, minerals, vitamins, and water
4. What kinds of food are unhealthy?
 - a. Fried, fatty, overly salty foods can lead to high blood pressure and coronary disease
 - b. Everyone is different: Normally when we eat these foods they build up in your blood vessels and cause circulation problems.
5. Plate activity to learn portion size and food groups.
6. Optional activities:
 - a. On-going: Students keep a food log for a short period of time; possibly graph their foods according to the food plate (could be started at the beginning of the unit for use during this lesson)
 - b. Build a meal game:
<http://www.nourishinteractive.com/kids/en/build-a-meal/build-a-meal>
 - c. Interactive Nutrition Label Game
<http://www.nourishinteractive.com/kids/healthy-games/7-ride-the-food-label-game-nutrient-information>

*b and c should be done at home or in a computer lab setting

Resources:

- a. Handouts
- b. BrainPop, Jr.; Eating Right and Food Groups movies and activities: <http://www.brainpopjr.com/health>
- c. Food Plate activities and worksheets;
www.Choosemyplate.gov
<http://www.garmaonhealth.com/wp-content/uploads/2011/06/usda-food-plate.bmp>
- d. KidsHealth in the Classroom; Nutrition articles:
http://kidshealth.org/kid/htbw/htbw_main_page.html

Lesson 16: Exercise

Objective: Identify and explain how exercise effects the human body

Standards:

- Health - 2.1.4.A.2
2.3.4.B.2
- Science - 5.3.4.A.2
5.3.4.A.3

Procedures:

1. KWL Exercise
2. Identify types of exercise and its relationship to the health of various body systems.
 - a. How much exercise is recommended for 8 & 9 year old children?
 - b. How much exercise do you do a day?
 - c. What are appropriate exercise options for children?
Examples: stairs vs. escalator, different exercises for various times
3. Making lifelong choices about nutrition and exercise to achieve personal wellness.

Resources:

- a. BrainPop, Jr.; Exercise movie and activities:
www.brainpopjr.com/health
- b. Contact PE teacher for cross-curricular lessons
- c. Keep an exercise/nutrition log for a week; possibly graph results
- d. Mrs. Obama's fitness campaign:
<http://www.letsmove.gov/activeschools.php>
- e. Presidential Council for Physical fitness: registration required
<http://www.presidentschallenge.org/>
- f. National Geographic:
<http://channel.nationalgeographic.com/episode/incredible-human-machine-3077/Overview#tab-interactive>; complex teacher resource
- g. KidsHealth in the Classroom; Nutrition Exercise articles:
http://kidshealth.org/kid/htbw/htbw_main_page.html

Lesson 17: Personal Safety

Objective: Identify and explain different types of abuse and where help can be found

Standards:

- Health - 2.1.4.D.2
- Science - N/A

Procedure:

1. Attend Kids on the Block Assembly

Lesson 18: Where to Get Help?

Objective: Identify and explain the health services and resources in your community to help you address health needs and emergencies

Standards:

- Health - 2.2.4.E.1
- Science - N/A

Procedures:

1. Initiate discussion:
 - a. If you were home with an adult and the adult had a medical emergency and they need your help, what would you do?
2. Fill out 911 worksheet for child to take home and display

Resources:

- a. Handout

Assessment idea:

1. Design a health plan for peers that demonstrates how to enhance the health of various human body systems.

Human Body Systems 3rd Grade Curriculum Standards

State Standards Health	
2.1 Wellness: All students will acquire health promotion concepts and skills to support a healthy, active lifestyle.	
CPI #2.1 A	Cumulative Progress Indicator (CPI) Strand A Personal Growth and Development
2.1.4.A.2	Determine the relationship of personal health practices and behaviors on an individual's body systems.
CPI #2.1.D	Cumulative Progress Indicator (CPI) Strand D Safety
2.1.4.D.2	Summarize the various forms of abuse and ways to get help.
CPI #2.1.E	Cumulative Progress Indicator (CPI) Strand E Social and Emotional Health
2.1.4.E.1	Compare and contrast how individuals and families attempt to address basic human needs.
	2.2 Integrated Skills: All students will develop and use personal and interpersonal skills to support a healthy, active lifestyle
CPI #2.2.A	Cumulative Progress Indicator (CPI) Strand A Interpersonal Communication
2.2.4.A.2	Demonstrate effective interpersonal communication when responding to disagreements or conflicts with others.
CPI #2.2.E	Cumulative Progress Indicator (CPI) Strand E Health Services and Information
2.2.4.E.1	Identify health services and resources provided in the school and community and determine how each assists in addressing health needs and emergencies.
	2.3 Drugs and Medicines: All students will acquire knowledge about alcohol, tobacco, other drugs, and medicines and apply these concepts to support a healthy, active lifestyle.
CPI #2.3.C	Cumulative Progress Indicator (CPI) Strand Alcohol, Tobacco, and Other Drugs
2.3.4.B.2	Compare the short- and long-term physical effects of all types of tobacco use.
2.3.4.B.3	Identify specific environments where second-hand/passive smoke may impact the wellness of nonsmokers.
2.3.4.B.4	Summarize the short- and long-term physical and behavioral defects of alcohol use and abuse.

State Standards Science		
5.3 Life Science: Life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.		
CPI #5.3 A	Cumulative Progress Indicator (CPI)	
	Strand A	Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.
5.3.4.A.1	Develop and use evidence-based criteria to determine if an unfamiliar object is living or nonliving.	
5.3.4.A.2	Compare and contrast structures that have similar functions in various organisms, and explain how those functions may be carried out by structures that have different physical appearances.	
5.3.4.A.3	Describe the interactions of systems involved in carrying out everyday life activities.	
5.3.4.D.1	Compare the physical characteristics of the different stages of the life cycle of an individual organism, and compare the characteristics of life stages among species.	

Other 3rd Grade Health Curriculum Standards

Note: These state curriculum standards are addressed via guidance lessons, classroom community building activities, and/or school-wide community service projects.

2.1.4.E.1 Compare and contrast how individuals and families attempt to address basic human needs.

2.1.4.E.2 Distinguish among violence, harassment, gang violence, discrimination, and bullying and demonstrate strategies to prevent and resolve these types of conflicts.

2.1.4.E.3 Determine ways to cope with rejection, loss, and separation.

2.1.3.E.4 Summarize the causes of stress and explain ways to deal with stressful situations.

2.2.4.A.2 Demonstrate effective interpersonal communication when responding to disagreements or conflicts with others.

2.2.4.C.1 Determine how an individual's character develops over time and impacts personal health.

2.2.4.C.2 Explain why core ethical values (such as respect, empathy, civic mindedness, and good citizenship) are important in the local and world community.

2.2.4.C.3 Determine how attitudes and assumptions toward individuals with disabilities may negatively or positively impact them.

2.2.4.D.1 Explain the impact of participation in different kinds of service projects on community wellness.