You and Your Body

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About **You and Your Body**

DeltaScienceModules, THIRD EDITION

Students explore *You and Your Body* through fourteen hands-on activities and the Delta Science Reader. First your class will examine the skeletal system, identifying major bones and joints. Next they replicate the arm's muscle coordination and measure reaction time. They model the pumping action of the heart, calculate lung capacity, and investigate respiration. They find out why we have different types of teeth and how to keep them healthy. Skin is exposed as a versatile body part, not only for cooling and protecting us, but also for sensing our environment. Students discover how the five senses work to perceive and evaluate incoming information. Finally, because the body runs on fuel, students test foods for nutrient content and practice reading nutrition labels.

In the Delta Science Reader *You and Your Body,* students read about how cells—the body's building blocks—make up tissues, organs, and organ systems. Then students explore some of the body's main systems—skeletal, muscular, circulatory, respiratory, digestive, and nervous. The book also touches briefly on the endocrine, immune, reproductive, and excretory systems. Biographies of two medical pioneers, Dr. Charles Drew and Dr. Elizabeth Blackwell, are included. The book concludes with a look at how reflexes work.

Overview Chart for Hands-on Activities

Hands-on Activity	Student Objectives
1 **Human Bones** *page 13*	• identify some of the bones in the human body • observe that bones support the body and protect vital organs • observe that bones are connected to one another at the joints • construct a model of the leg
2 **Muscles and Movement** *page 19*	• construct a model of the arm • observe how muscles move bones
3 **Reaction Time** *page 27*	• conduct tests to determine their reaction times • record and graph their data • determine that practice improves (decreases) reaction time, at least initially
4 **The Pumping Heart** *page 33*	• examine the structure of the heart • model the pumping mechanism of the heart
5 **Lung Volume and Vital Capacity** *page 41*	• measure body height and the vital capacity of their lungs • infer a relationship between height and vital capacity • calculate how much air they breathe in a minute, hour, and day
6 **Lung Function** *page 49*	• build a lung/diaphragm model • observe how the lungs work
7 **Skin** *page 55*	• observe and discuss the protective properties of skin • discuss the role of skin in regulating body temperature • observe the cooling effect of perspiration
8 **Teeth** *page 61*	• observe and identify each type of human tooth • infer that different teeth have different functions, depending on their shape • discuss ways to keep teeth healthy
9 **Testing for Fat** *page 67*	• guess which of the foods to be tested contain the most fat • test a variety of foods to determine whether they contain fat
10 **Testing for Protein** *page 73*	• guess which of the foods to be tested contain the most protein • test a variety of foods to determine the relative protein content of each
11 **Testing for Carbohydrates** *page 79*	• guess which of the foods to be tested contain the most starch and glucose • test a variety of foods to determine the relative starch and glucose contents of each
12 **Human Nutrition** *page 85*	• apply their food test data from Activities 9–11 • discuss what makes a well-balanced, healthy diet • are introduced to the Food Guide Pyramid • learn how to read food labels
13 **Smell** *page 91*	• name the five human senses • identify four different odors using only their sense of smell • learn how information about smells is transmitted to the brain
14 **Touch, Hearing, and Sight** *page 97*	• discuss the senses of touch, hearing, and sight • test their senses of touch, hearing, and sight, one sense at a time • discover that using two or more senses together makes it easier to identify an object
Assessment *page 103*	• See page 103.

Process Skills	Vocabulary	Delta Science Reader
observe, make and use models	**clavicle, cranium, femur, fibula, humerus, joint, mandible, patella, pelvis, radius, rib, scapula, skeletal system, skeleton, sternum, tibia, ulna, vertebra**	page 4
make and use models, observe	**biceps, extensor, flexor, muscle, muscular system, tendon, triceps**	page 5
predict; experiment; measure; collect, record, display, or interpret data; infer	**reaction time**	page 10
predict, observe, make and use models	**aorta, artery, atrium, blood vessel, circulatory system, pulse, vein, ventricle**	pages 6, 7
predict; use numbers; measure; infer; collect, record, display, or interpret data	**lung volume, residual volume, respiration rate, vital capacity**	page 8
make and use models, observe	**diaphragm, lungs, respiratory system, trachea**	page 8
predict, observe, communicate	**dermis, epidermis, perspiration**	page 11
observe, infer, communicate	**bicuspid, canine, digestive system, incisor, molar, plaque**	page 9
predict; collect, record, display, or interpret data; observe	**fat**	page 9
predict; collect, record, display, or interpret data; observe	**indicator, protein**	page 9
predict; collect, record, display, or interpret data; observe	**carbohydrate, starch, sugar**	page 9
communicate, compare, classify	**mineral, nutrient, vitamin**	page 9
observe	**nervous system, olfactory membrane**	pages 10, 14
predict, observe, communicate	**cornea, eardrum, hearing, iris, lens, optic nerve, pupil, retina, sight, sound waves, vitreous humor**	page 10

See the following page for the Delta Science Reader Overview Chart.

Overview Chart for Delta Science Reader
You and Your Body

Selections	Vocabulary	Related Activity
Think About...		
Body Building Blocks *pages 2–3*	cell, cell division, cell membrane, cytoplasm, nucleus, organ, organ system, tissue	
What Are the Body's Main Systems?		
• **Skeletal System** *page 4*	cartilage, endoskeleton, exoskeleton, joint, marrow, skeletal system	Activity 1
• **Muscular System** *page 5*	cardiac muscle, extensor, flexor, ligament, muscular system, skeletal muscle, smooth muscle, tendon	Activity 2
• **Circulatory System** *pages 6–7*	aorta, artery, blood, blood vessel, capillary, circulatory system, heart, vein	Activity 4
• **Respiratory System** *page 8*	alveoli, diaphragm, lung, respiration, respiratory system, trachea	Activities 5, 6
• **Digestive System** *page 9*	digestion, digestive system, villi	Activities 8–12
• **Nervous System** *page 10*	brain, motor nerve, nervous system, neuron, receptor, sensory nerve, spinal cord	Activities 3, 13, 14
• **Other Body Systems** *page 11*	antibody, antigen, endocrine system, excretory system, gland, hormone, immune system, pathogen, reproductive system	
People in Science		
Charles Drew, M.D. *page 12*		Activity 4
Elizabeth Blackwell, M.D. *page 13*		
Did You Know?		
How a Reflex Works *page 14*	reaction time, reflex	Activity 3

See pages 111–119 for teaching suggestions for the Delta Science Reader.

MATERIALS LIST

You and Your Body

Quantity	Description
16	balls, table tennis*
1	balloons, small, p/8*
1	balloons, large, p/12*
1	Biuret solution, 500 mL*
8	blindfolds
2	bottles, dropper, p/8
4	bottles, plastic pump, p/2
8	bottles, squeeze
8	boxes, odor, with lid, p/2
1	chart, Food Guide Pyramid
1	chart, grid*
1	cotton balls, p/100*
100	cups, plastic
1	extract, banana, 1 oz*
1	extract, lemon, 1 oz*
1	extract, mint, 1 oz*
1	extract, vanilla, 1 oz*
1	glucose test strips, p/40*
1	glue, 4 oz*
1	iodine, 100 mL*
1	labels, p/100*
8	lung volume bags
8	mirrors
1	paper clips, p/100*
1	paper fasteners, p/100
1	paper, brown, roll*
16	pushpins
1	rubber bands, p/60*
8	spheres, foam
8	spheres, glass
8	spheres, plastic
8	spheres, rubber
8	spheres, steel
8	spheres, wood
1	tape, masking*
1	toothpicks, p/250*
1	transparency, eye
1	transparency, heart
1	transparency, lungs
1	transparency, skeleton
1	transparency, teeth
16	trays, plastic
32	tubes, cardboard, large*
32	tubes, cardboard, small*
8	tubes, clear plastic
1	tubing, 60 cm
8	vial caps, with holes
1	**Teacher's Guide**
8	**Delta Science Readers**

TEACHER-PROVIDED ITEMS

Quantity	Description
4	apples*
–	food samples*
32	goggles, safety
1	knife, kitchen
2	knives, plastic
17	oranges*
–	paper towels*
16	rulers, metric
16	scissors
5	spoons, plastic
1	string, roll
–	water, tap*

* = consumable item

† = in separate box

To order consumable items or refill kits, please call 1-800-442-5444.

Activity Summary

In this Delta Science Module, students investigate several organ systems of the human body as well as foods and nutrition.

ACTIVITY 1 Students are introduced to the bones that make up the human skeleton and they identify the major bones. Students then construct a model of the leg and observe and discuss the role of joints in movement.

ACTIVITY 2 Muscles are explored and students construct a model of the arm that simulates the function of the biceps and triceps in moving the arm. The students discuss how muscles are responsible for movement of, and in, our bodies.

ACTIVITY 3 In this activity, reaction time is discussed. Students conduct several experiments that demonstrate the time required to react to a stimulus.

ACTIVITY 4 Students investigate the heart. They explore the structure of the heart and discuss how its contraction and dilation result in a pumping action that forces blood throughout the body. The activity includes observing a model that demonstrates the pumping action of the heart.

ACTIVITY 5 Students investigate the structure and function of the lungs. They measure the vital capacity of their lungs and relate this to their height. After they graph these data, they calculate how much air they breathe during a minute, an hour, and a day.

ACTIVITY 6 Students build a simple lung/diaphragm model. They observe and discuss the physical principles that result in inhaling and exhaling air into and out of the lungs.

ACTIVITY 7 Students observe the skin's role in protection and cooling of the body. They discuss how skin provides a physical barrier to germs and the environment and how perspiration evaporates, thus helping to cool the body.

ACTIVITY 8 Students investigate teeth by identifying and naming the different types of human teeth. They observe that form follows function, that is, certain shaped teeth have specific functions. They discuss how sharp incisors cut and tear food, whereas the large flat molars grind and process food. They then discuss several ways to keep their teeth healthy, that is, regular flossing, brushing, and a healthy diet.

ACTIVITIES 9–12 Students discover that food can be broken down into components called nutrients—fats, proteins, carbohydrates (sugars and starches), vitamins, and minerals. Students conduct four separate tests on several foods to determine the presence of fats, proteins, or carbohydrates. After the students have discussed the results of their tests, they are introduced to the Food Guide Pyramid, the food groups, and how to read nutritional labels on commercially packaged foods. Being aware of this information allows the students to understand the role of good nutrition in maintaining healthy bodies.

ACTIVITIES 13 and 14 Students examine the senses of smell, touch, hearing, and sight. They discuss these senses and conduct a series of tests to identify several objects. First, students try to identify the contents of odor boxes by using only their sense of smell. Next, blindfolded students conduct experiments in an attempt to identify objects by using only touch and hearing. Finally, students attempt to identify the composition of objects using only their sight. As a result of all the tests conducted, the students discover that, although the senses work independently, they are most helpful when several senses are used together to identify an object.