

The Human Body

SYSTEMS AND SENSES

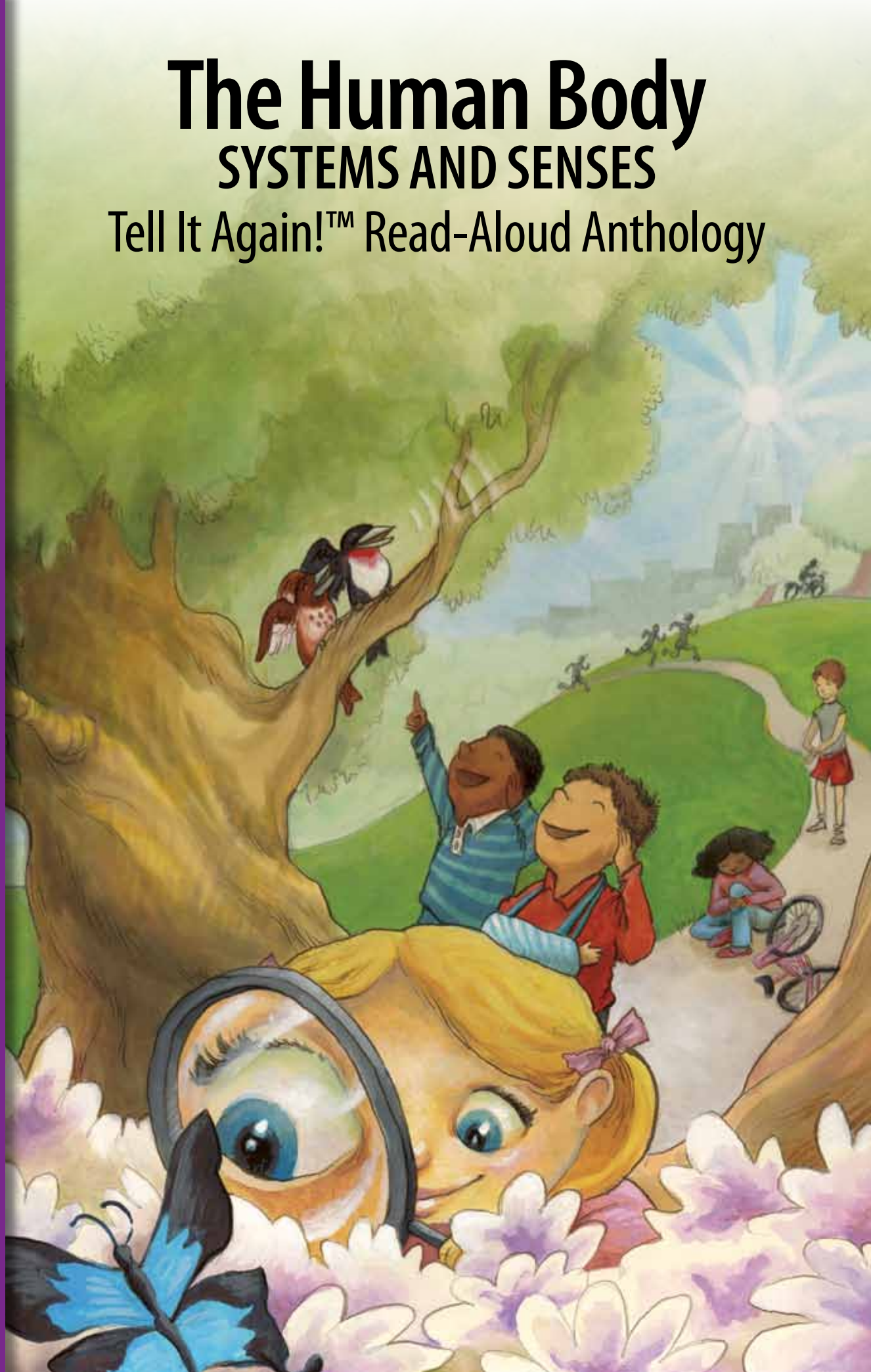
Tell It Again!™ Read-Aloud Anthology

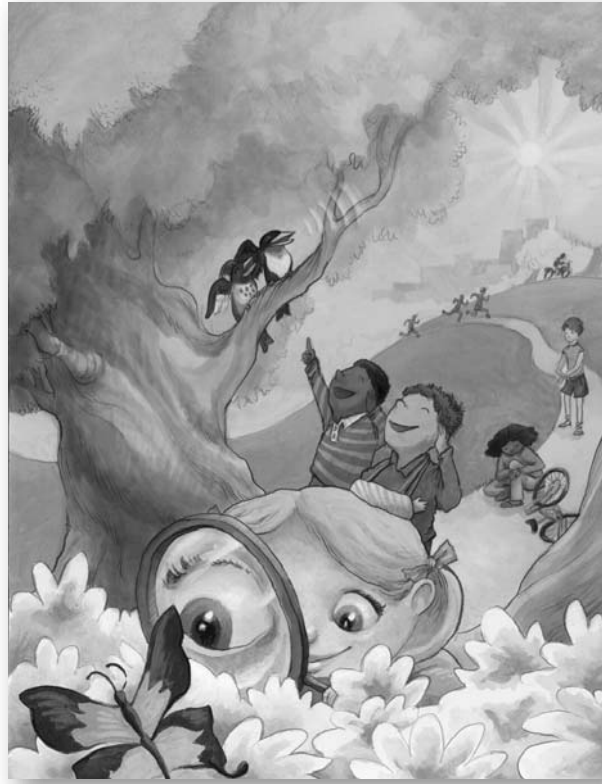
Core Knowledge Language Arts® • Listening & Learning™ Strand



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The Human Body

SYSTEMS AND SENSES

Tell It Again![™] Read-Aloud Anthology

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GRADE 3

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SYSTEMS AND SENSES

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Alignment Chart for The Human Body: Systems and Senses

The following chart contains core content objectives addressed in this domain. It also demonstrates alignment between the Common Core State Standards and corresponding Core Knowledge Language Arts (CKLA) goals.

Alignment Chart for The Human Body: Systems and Senses

Lesson

	1	2	3	4	5	6	7	8	9
Core Content Objectives									
Briefly describe and/or review seven of the systems of the human body	✓								✓
Explain that the human body includes the following systems and identify the function of each: skeletal, muscular, and nervous	✓	✓	✓	✓	✓				✓
Identify cells as the basic building blocks of all living things and explain that most cells are too small to be seen without a microscope	✓								✓
Explain the relationship between cells, tissues, organs, and systems	✓								✓
Explain that each system is made up of different types of cells (bone cells, muscle cells, nerve cells, blood cells, etc.)	✓								✓
Explain that one of the systems of the human body is the skeletal system and that it has two parts		✓							
Recall that there are 206 bones in the human body		✓							
Explain briefly the composition of bones		✓							
Identify examples of axial bones and explain their functions		✓							
Identify examples of appendicular bones and explain their functions			✓						
Identify three different types of joints and give examples of each: movable, immovable, and partially movable			✓						
Describe how doctors are able to see and treat the skeletal system using an x-ray			✓						
Explain the importance and purpose of cartilage			✓						
Identify skeletal, smooth, and cardiac as three types of muscles in the human body and describe their functions				✓					
Compare and contrast involuntary and voluntary muscles				✓					
Explain that skeletal muscles work closely with bones to give the human body mobility				✓					

**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

	1	2	3	4	5	6	7	8	9
Demonstrate familiarity with the legend of the Achilles heel/tendon				✓					
Identify the brain and the spinal cord as the control center of the body					✓	✓			
Identify nerves as messengers that transmit information from all of the parts of the body through the spinal cord to the brain					✓	✓			
Explain how the skeletal, muscular, and nervous systems are interconnected					✓				
Explain that the five senses work with the brain to process information about our surroundings					✓		✓	✓	
Describe a reflex action as a quick, unconscious action and explain its purpose in protecting the human body					✓				
Identify the parts of the brain and their functions: brain stem (medulla), cerebrum, cerebellum						✓			
Describe the human brain as divided into two hemispheres and explain that each hemisphere controls the muscles of the opposite side of the body						✓			
Identify the surrounding, outer, and inner parts of the eye							✓		
Explain how the parts of the outer and inner eye work together with the brain to allow a person to see							✓		
Describe nearsightedness and farsightedness and how these can be corrected							✓		
Identify the parts and functions of the outer, middle, and inner ear								✓	
Describe how sound travels through all the parts of the ear								✓	
Describe how the parts of the ear work together with the brain to allow a person to hear								✓	
Explain that cochlear implants can help some people who cannot hear								✓	
Identify ways to take care of the human body									✓

**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Reading Standards for Informational Text: Grade 3

Key Ideas and Details

STD RI.3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.								
CKLA Goal(s)	Ask and answer questions (e.g., <i>who, what, where, when, why, how</i>), orally or in writing, requiring literal recall and understanding of the details and/or facts of a nonfiction/informational read-aloud								
	Ask and answer questions, orally or in writing, that require making interpretations, judgments, or giving opinions about what is heard in a nonfiction/informational read-aloud, including asking and answering <i>why</i> questions that require recognizing or inferring cause/effect relationships								
STD RI.3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.								
CKLA Goal(s)	Determine the main idea of a nonfiction/informational read-aloud; recount the key details and explain how they support the main idea								
STD RI.3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.								
CKLA Goal(s)	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a nonfiction/informational read-aloud, using language that pertains to time, sequence, and cause/effect								

Craft and Structure

STD RI.3.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a Grade 3 topic or subject area.								
CKLA Goal(s)	Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases								
	Determine the meaning of general academic and domain-specific words and phrases in a nonfiction/informational read-aloud relevant to a Grade 3 topic or subject area								

**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

		1	2	3	4	5	6	7	8	9
Integration of Knowledge and Ideas										
STD RI.3.7	Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).									
CKLA Goal(s)	Describe images, orally or in writing, and how they contribute to what is conveyed by the words in a nonfiction/informational read-aloud (e.g., where, when, why, and how key events occur)	✓	✓	✓		✓	✓	✓	✓	✓
	Use images (e.g., maps, photographs) accompanying a nonfiction/informational read-aloud to check and support understanding					✓				
	Interpret information from diagrams, charts, graphs, and/or graphic organizers					✓				
STD RI.3.9	Compare and contrast the most important points and key details presented in two texts on the same topic.									
CKLA Goal(s)	Compare and contrast the most important points and key details presented in two nonfiction/informational read-alouds on the same topic	✓	✓	✓	✓	✓	✓			✓
Writing Standards: Grade 3										
Text Types and Purposes: Narrative										
STD W.3.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.									
STD W.3.3a	Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally.									
CKLA Goal(s)	Identify and use parts of a paragraph, including a topic sentence, supporting details and a concluding statement, in a narrative piece							✓	✓	✓
	Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally						✓	✓	✓	✓
STD W.3.3b	Use dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations.									
CKLA Goal(s)	Use dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations						✓	✓	✓	✓
STD W.3.3c	Use temporal words and phrases to signal event order.									
CKLA Goal(s)	Use temporal words and phrases to signal event order in a narrative piece						✓	✓	✓	✓

**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

		1	2	3	4	5	6	7	8	9
STD W.3.3d	Provide a sense of closure.									
CKLA Goal(s)	Provide a sense of closure in a narrative piece							✓	✓	✓
Production and Distribution of Writing										
STD W.3.4	With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in Standards 1–3 above.)									
CKLA Goal(s)	With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose, i.e., ideas and paragraphs presented clearly and in a logical order									✓
STD W.3.5	With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language Standards 1–3 up to and including Grade 3 on pages 28 and 29.)									
CKLA Goal(s)	With guidance and support from peers and adults, use the writing process of plan, draft, edit, and publish to develop and strengthen writing							✓	✓	✓
STD W.3.6	With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.									
CKLA Goal(s)	Share writing with others									
	With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others**									✓
Research to Build and Present Knowledge										
STD W.3.8	Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.									
CKLA Goal(s)	Make personal connections (orally or in writing) to events or experiences in a fiction or nonfiction/informational read-aloud, and/or make connections among several read-alouds	✓					✓	✓		✓
	Gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories			✓					✓	
	Categorize and organize facts and information within a given domain									✓

**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

		1	2	3	4	5	6	7	8	9
STD W.3.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.									
CKLA Goal(s)	Write responses to fiction and nonfiction/informational read-alouds that demonstrate understanding of the text and/or express/support opinion, using examples from a text and distinguishing own point of view from that of the author, narrator, or characters (short time frame)									
	With guidance and support from peers and adults, use the writing process of plan, draft, edit, and publish to develop and strengthen writing (extended time frame)									
	Write sentences to represent the main idea and details from a fiction or nonfiction/informational read-aloud (short time frame)									

Speaking and Listening Standards: Grade 3

Comprehension and Collaboration

STD SL.3.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on Grade 3 topics and texts, building on others' ideas and expressing their own clearly.									
STD SL.3.1a	Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.									
CKLA Goal(s)	Carry on and participate in a conversation with an adult or peer for at least six turns, staying on topic, building on others' ideas, and expressing their own ideas clearly									
	Demonstrate preparedness for a discussion, having read or studied required material, explicitly drawing on preparation and other information known about the topic to explore content under discussion									
	Prior to listening to a read-aloud, identify (orally or in writing) what they know and have learned that may be related to the specific read-aloud or topic									
	Make predictions (orally or in writing) prior to and during a read-aloud, based on the title, images, and/or text heard thus far, and then compare the actual outcomes to predictions									



**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

		1	2	3	4	5	6	7	8	9
STD SL.3.1b	Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).									
CKLA Goal(s)	Use agreed-upon rules for group discussions, i.e., look at and listen to the speaker, raise hand to speak, take turns, say “excuse me” or “please,” etc.									
STD SL.3.1c	Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.									
CKLA Goal(s)	Interpret information presented, and then ask questions to clarify information or the topic in a fiction or nonfiction/informational read-aloud									
STD SL.3.1d	Explain their own ideas and understanding in light of the discussion.									
CKLA Goal(s)	During a discussion, explain ideas and understanding in relation to the topic									
STD SL.3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.									
CKLA Goal(s)	Ask and answer questions to clarify directions, exercises, and/or classroom routines and/or what a speaker says about a topic to gather additional information or deepen understanding of a topic or issue									
Presentation of Knowledge and Ideas										
STD SL.3.4	Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.									
CKLA Goal(s)	Summarize (orally or in writing) read-aloud content and/or oral information presented by others									
	Retell (orally or in writing) important facts and information from a fiction or nonfiction/informational read-aloud									
STD SL.3.6	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. (See Grade 3 Language Standards 1 and 3 on pages 28 and 29 for specific expectations.)									
CKLA Goal(s)	Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification									

**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

		1	2	3	4	5	6	7	8	9
Language Standards: Grade 3										
Vocabulary Acquisition and Use										
STD L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on Grade 3 reading and content, choosing flexibly from a range of strategies.									
STD L.3.4a	Use sentence-level context as a clue to the meaning of a word or phrase.									
CKLA Goal(s)	Use sentence-level context as a clue to the meaning of a word or phrase									
STD L.3.4b	Determine the meaning of the new word formed when a known affix is added to a known word (e.g., <i>agreeable/disagreeable, comfortable/uncomfortable, care/careless, heat/preheat</i>).									
CKLA Goal(s)	Determine the meaning of the new word formed when a known affix is added to a known word (e.g., <i>agreeable/disagreeable, comfortable/uncomfortable, care/careless, heat/preheat</i>)				✓	✓				
STD L.3.4c	Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., <i>company, companion</i>).									
CKLA Goal(s)	Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., <i>company, companion</i>)		✓							
STD L.3.5	Demonstrate understanding of word relationships and nuances in word meanings.									
STD L.3.5a	Distinguish the literal and nonliteral meanings of words and phrases in context.									
CKLA Goal(s)	Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases	✓					✓			✓
	Distinguish literal language from figurative language as used in a fiction or nonfiction/informational read-aloud				✓	✓				
STD L.3.5b	Identify real-life connections between words and their use (e.g., describe people who are <i>friendly</i> or <i>helpful</i>).									
CKLA Goal(s)	Provide and/or use synonyms and antonyms	✓			✓					
	Identify real-life connections between words and their use (e.g., describe people who are <i>friendly</i> or <i>helpful</i>)									
STD L.3.6	Acquire and use accurately grade-appropriate conversational, general academic, and domain specific words and phrases, including those that signal spatial and temporal relationships (e.g., <i>After dinner that night we went looking for them</i>).									
CKLA Goal(s)	Acquire and use accurately grade-appropriate conversational, general academic, and domain specific words and phrases, including those that signal spatial and temporal relationships					✓				


**Alignment Chart for
The Human Body: Systems and Senses**

Lesson

1	2	3	4	5	6	7	8	9
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Additional CKLA Goals

CKLA Goal(s)	1	2	3	4	5	6	7	8	9
Listen to and understand a variety of texts, including informational texts, riddles, poems, and myths									

 These goals are addressed in all lessons in this domain. Rather than repeat these goals as lesson objectives throughout the domain, they are designated here as frequently occurring goals.

** The publishing step of the narrative writing piece has been placed at the beginning of Pausing Point 2. It is highly recommended that this first section of Pausing Point 2 be regarded as *required* in order to most accurately align with the writing requirements of the Common Core State Standards.



Introduction to The Human Body: Systems and Senses

This introduction includes the necessary background information to be used in teaching *The Human Body: Systems and Senses* domain. The *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses* contains nine daily lessons, each of which is composed of two distinct parts—the Read-Aloud and the Extension—so that the lessons may be divided into smaller chunks of time and presented at different intervals during the day. Each entire lesson will require a total of seventy minutes.

In addition to these lessons, there are two Pausing Points in this domain: one after Lesson 5, and another after Lesson 9. These Pausing Points are designed to allow four total days for reviewing, reinforcing, or extending the material taught up to that point. Two days are included for the Domain Assessment, additional review and reassessment as needed, and extension of the writing process. **You should spend no more than fifteen days total on this domain.**

Domain Overview

Here is an overview of the schedule for *The Human Body: Systems and Senses*. Please see the Unit 3 Teacher Guide for the corresponding Skills schedule.

WEEK ONE						
Min.	Day 1	#	Day 2	#	Day 3	#
50	Lesson 1: “Building Blocks and Systems”		Lesson 2: “The Skeletal System: Axial Bones”		Lesson 3: “The Skeletal System: Appendicular Bones”	
20	Lesson 1B: Extensions		Lesson 2B: Extensions		Lesson 3B: Extensions	
					Lesson 4: “The Muscular System”	
					Lesson 5: “The Nervous System”	
					Lesson 4B: Extensions	
					Lesson 5B: Extensions	

WEEK TWO						
Min.	Day 6	#	Day 7	#	Day 8	Day 9
50	Pausing Point 1, Day 1		Pausing Point 1, Day 2		Lesson 6: “The Nervous System and the Brain”	Lesson 7: “Vision: The Parts of the Eye”
20					Lesson 6B: Extensions; Narrative Writing: Plan	Lesson 7B: Extensions; Narrative Writing: Draft
						Lesson 8: “Hearing: The Parts of the Ear”
						Lesson 8B: Extensions; Narrative Writing: Draft/Revise

WEEK THREE					
Min.	Day 11	Day 12 #	Day 13 # ⑩	Day 14 ⑩	Day 15
50	Lesson 9: “A Clean Bill of Health”	Pausing Point 2, Day 1	Pausing Point 2, Day 2	Domain Assessment	Reassess/Remediate as needed; Narrative Writing: Publish
20	Lesson 9B: Extensions; Narrative Writing: Edit/Final Copy	Pausing Point 2, Day 1; Narrative Writing: Publish	Pausing Point 2, Day 2; Narrative Writing: Publish	Domain Assessment; Narrative Writing: Publish	Narrative Writing: Publish
30	Narrative Writing: Edit/Final Copy	Narrative Writing: Publish	Narrative Writing: Publish	Narrative Writing: Publish	Narrative Writing: Publish

⑩ Lessons include Student Performance Task Assessments

Lessons require advanced preparation and/or additional materials; please plan ahead

† The publishing step of this narrative writing piece has been placed at the beginning of Pausing Point 2. It is highly recommended that you regard this part of Pausing Point 2 as *required* in order to most accurately align with the writing requirements of the Common Core State Standards.

Domain Components

Along with this anthology, you will need:

- *Tell It Again! Media Disk* or the *Tell It Again! Flip Book** for *The Human Body: Systems and Senses*
- *Tell It Again! Image Cards* for *The Human Body: Systems and Senses*

*The *Tell It Again! Posters* for *The Human Body: Systems and Senses* are located at the end of the *Tell It Again! Flip Book*.

You may wish to have one notebook/binder readily available for each student to be used for note-taking and other writing opportunities, including “domain dictionaries” and writing prompts in the comprehension questions.

You will find the Instructional Objectives and Core Vocabulary for this domain below. The lessons that include Image Cards, Posters, Instructional Masters, and Assessments are also listed in the information below.

Why The Human Body: Systems and Senses Is Important

This domain reviews what students have already learned about the human body and some of its systems. Two systems students have previously learned about in greater depth are the excretory and digestive systems in Grade 2, so these are briefly reviewed here. In this domain, students will focus in greater detail on the skeletal, muscular, and

nervous systems and the fact that they are closely interconnected with all the human body systems. Furthermore, students will learn details about the senses of sight and hearing, and how the eyes and ears work. Students will also learn the idiom “a clean bill of health,” and will discover ways they can keep their bodies active and healthy.

The content students learn in this grade will build on what students have learned in previous grades as well as serve as the basis for more in-depth study in the later grades of the human body and its other systems.

What Students Have Already Learned in Core Knowledge Language Arts During Kindergarten, Grade 1, and Grade 2

The following domains—and the specific core content that was targeted in those domains—are particularly relevant to the read-alouds students will hear in *The Human Body: Systems and Senses*. This background knowledge will greatly enhance your students’ understanding of the read-alouds they are about to enjoy:

The Five Senses (Kindergarten)

- Identify and demonstrate understanding of the five senses: sight, hearing, smell, taste, and touch
- Identify each of the body parts associated with the five senses
- Provide simple explanations about how the eyes, ears, nose, tongue, and skin work and their function
- Describe how the five senses help humans learn about their world
- Describe some ways the five senses help protect people from harm
- Describe the experiences and challenges of someone who is blind or deaf

The Human Body (Grade 1)

- Explain that the human body is a network of systems
- Explain that all living things are made of microscopic cells
- Identify five of the body systems: skeletal, muscular, digestive, circulatory, and nervous
- Recall basic facts about the skeletal system
- Recall basic facts about the muscular system
- Define the heart as a muscle that never stops working


- Recall basic facts about the circulatory system
- Recall basic facts about the nervous system

The Human Body: Building Blocks and Nutrition (Grade 2)

- Identify the brain as the body’s control center
- Recall basic facts about the digestive system
- Identify important components of the digestive system and their functions
- Recall basic facts about the excretory system
- Identify important components of the excretory system and their functions
- Describe how the digestive and excretory systems work together
- Describe the process of nourishing the body from the time food is taken into the mouth until waste is removed from the body
- Explain the importance of exercise, cleanliness, a balanced diet, and rest for bodily health
- Explain the importance of regular checkups

Core Vocabulary for The Human Body: Systems and Senses

The following list contains all of the core vocabulary words in *The Human Body: Systems and Senses* in the forms in which they appear in the text. The vocabulary words used in the Word Work activities are boldfaced. The multiple-meaning vocabulary words that are used as activities in the Pausing Points are marked with a + sign. The inclusion of the words on this list *does not* mean that students are immediately expected to be able to use all of these words on their own. However, through repeated exposure throughout the lessons, they should acquire a good understanding of most of these words and begin to use some of them in conversation.

 **Note:** You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

Lesson 1

cells*
circulate
functions
interconnected
organs*+
systems
tissues*

Lesson 2

axial bones
cartilage*
cranium*
marrow*
spinal column
structure
vital

Lesson 3

appendages
appendicular bones
femur
fibula*
joint*
ligaments*
tibia*

Lesson 4

cardiac muscle
contract
involuntary muscle*
muscles*
nerves
voluntary muscles*
vulnerable*

Lesson 5

command
consciously
coordinates
fibers*
receptors
reflex*
unconsciously

Lesson 6

accurate
brain stem
cerebellum*
cerebral cortex*
cerebrum*
dependent
hemispheres*
medulla*

Lesson 7

cornea*
farsightedness*
iris*
lens*
nearsightedness*
pupil*+
retina*

wondrous

Lesson 8

cochlea*
ear canal*
eardrum*
impulses
inner ear*
middle ear*
outer ear*

Lesson 9

delicate
diet
miraculously
posture
wiring

*The words or variations of the words marked with an asterisk are included in the Skills Reader and Vocabulary Cards.

Comprehension Questions

In the *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses*, there are three types of comprehension questions: literal questions to assess students' recall of the core content; inferential questions to guide students to infer information from the text and think critically; and evaluative questions to guide students to build upon what they have learned from the text to use their creative, analytical, and application skills. Many of these questions are also labeled as writing prompts and are discussed in more detail in the Writing Opportunities section in this introduction.



The last comprehension question in each lesson prompts students to ask, answer, and/or research any remaining questions they may have about the content; this question may also be expanded upon as an “Above and Beyond” research and/or writing activity. Many of these comprehension questions may also serve as meaningful take-home topics to discuss with family members.

It is highly recommended that students answer all comprehension questions in complete sentences—whether orally or in writing—using domain-related vocabulary whenever possible. You may wish to have students collect written responses in a notebook or folder.

Writing Opportunities

In the *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses*, the content is reinforced through a narrative piece, which students complete in Lessons 6–9, Pausing Point 2, and the domain genre writing time using the steps of the formal writing process: plan, draft, edit, and publish.

Everyday writing opportunities are included in the Comprehension Questions and Extensions in Lessons 1–9, as well as in both Pausing Points.

In the Comprehension Questions, shorter writing prompts that assess students' literal recall of the core content and provide practice for the short-answer writing section of the Domain Assessment are indicated by this icon: . Longer writing prompts that encourage students to think critically and expand creatively upon the content are indicated by this icon: . Some of these prompts may serve both purposes and may also be collected in a notebook or folder to provide source information for

students to reference when writing their formal writing piece.

For these writing sessions, it is highly recommended that students take 5–10 minutes of Discussing the Read-Aloud time to write a half to a full page in response to one or more of the prompts, during which time you are encouraged to circulate and provide over-the-shoulder conferencing for a group of students each day. During these daily writing sessions, you may also choose to reinforce what students are learning in the Skills strand by having them practice these skills in their writing. The goal of these extended writing sessions is to provide students with daily, “low-stakes” writing practice and to have them receive immediate feedback on the content, featured skill(s), and clarity and depth of their written expression. You may also choose to publish select pieces of students’ writing to reinforce a particular concept or skill. It is highly recommended that students share their writing on a daily basis as time permits.

Student Choice and Domain-Related Trade Book Extensions

In the *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses*, Student Choice and Domain-Related Trade Book activities are suggested in both Pausing Points. A list of recommended titles is included at the end of this introduction, or you may select another title of your choice.

The Human Body: Systems and Senses Image Cards

There are twenty-seven Image Cards in the *The Human Body: Systems and Senses* domain. These Image Cards may be used to support the technical vocabulary of human body parts, in addition to providing various image review and sorting activities regarding the skeletal, muscular, and nervous systems. In the *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses*, Image Cards are referenced in both Pausing Points and in Lessons 1–3, 6, 7, and 9.

The Human Body: Systems and Senses Posters

There are two Posters for *The Human Body: Systems and Senses* domain. Poster 1 displays seven of the human body systems. Poster 2 shows cells as the building blocks of the human body that form tissues, organs, and systems. It is recommended that you display these Posters in your classroom to easily reference while presenting the read-alouds. The *Tell It*

Again! Posters for The Human Body: Systems and Senses are located at the back of the *Tell It Again! Flip Book*.

Instructional Masters and Family Take-Home Letters

Blackline Instructional Masters and Family Take-Home Letters are included at the back of the *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses*. Instructional Masters are referenced in the Domain Assessment, in both Pausing Points, and in Lessons 1–9. Family Letters are referenced in Lessons 1B, 6B, and 9B.

Above and Beyond Opportunities

In the *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses*, there are numerous opportunities in the lessons and the Pausing Points to challenge students who are ready to attempt activities that are above grade-level. These activities are identified with this icon: ↗.

These opportunities may be found in the following: Comprehension Questions, Extensions, Pausing Point activities, research activities, and writing exercises.

You may also wish to assign some of these and other exercises as homework for students who are ready for a challenge outside of the classroom. Many of the comprehension questions also serve as meaningful take-home topics to discuss with family members.

Additionally, you may choose to coordinate with your school's science and/or social studies teacher(s) to further reinforce the content covered in this language arts block.

Student Performance Task Assessments

In the *Tell It Again! Read-Aloud Anthology for The Human Body: Systems and Senses*, there are numerous opportunities to assess students' learning. These assessment opportunities range from informal observation opportunities to more formal written assessments and are indicated by this icon: 10. There is also a cumulative Domain Assessment. Instructional Masters DA-1, DA-2, and DA-3 are used for this purpose. The correct answers and corresponding statements have been provided on the back of the Answer Keys for Part I and Part II of the Domain Assessment. You may wish to make a copy of the Answer Keys

to send home to family members. Use the Tens Conversion Chart located in the Appendix to convert a raw score on each assessment into a Tens score. On the same page, you will also find the rubric for recording observational Tens scores.

Recommended Resources for The Human Body: Systems and Senses

Trade Book List

It is highly recommended that students spend a minimum of twenty minutes each night reading independently or aloud to family members, or listening as family members read to them. You may suggest that they choose titles from this trade book list. These titles may also be put into the classroom book tub for various reading levels.

General Human Body Books

1. *Cells, Tissues, and Organs*, by Richard Spilsbury (Heinemann Library, 2008) ISBN 9781442037045
2. *The Human Body (A Magic Skeleton Book)*, by Janet Sacks (Sterling Publishing, 2002) ISBN 1402712146
3. *My Organ Buddies*, by Lee Downing and Felice Downing (Organ Buddies, Inc., 2010) ISBN 9780615329406
4. *Ultra-Organized Cell Systems*, by Rebecca L. Johnson (Millbrook Press, 2008) ISBN 9780822571384
5. *Watch Me Grow: Fun Ways to Learn About Cells, Bones, Muscles, and Joints*, by Michelle O'Brien-Palmer (Chicago Review Press, 1999) ISBN 155652367X
6. *Your Body Battles a Skinned Knee*, by Vicki Cobb, Dennis Kunkel, and Andrew N. Harris (Lerner Publishing Group, Inc., 2009) ISBN 9780822568148

The Skeletal System

7. *Bones: Our Skeletal System*, by Seymour Simon (HarperTrophy, 1998) ISBN 0688177212
8. *Bones and Muscles (Your Body Inside and Out)*, by Angela Royston (Sea-to-Sea Publications, 2012) ISBN 9781597712637
9. *The Skeletal System (Early Bird Body Systems)*, by Caroline Arnold (Lerner Publications Company, 2006) ISBN 0822525231

10. *The Skeletal System*, by Kay Manolis (Children’s Press, 2009) ISBN 1600142478

11. *Your Body Battles a Broken Bone*, by Vicki Cobb, Dennis Kunkel, and Andrew N. Harris (Lerner Publishing Group, Inc., 2009) ISBN 9781580138345

The Muscular System

12. *Muscles: Our Muscular System*, by Seymour Simon (HarperTrophy, 1998) ISBN 0688177204

13. *Muscles: Our Muscular System*, by Seymour Simon (Scholastic Inc., 1999) ISBN 0439078075

14. *The Muscular System (Early Bird Body Systems)*, by Rebecca L. Johnson (Lerner Publications Company, 2006) ISBN 0822525208

15. *The Muscular System*, by Kay Manolis (Children’s Press, 2009) ISBN 0531217035

The Skeletal-Muscular System

16. *The Mighty Muscular and Skeletal Systems*, by John Burstein (Crabtree Publishing Company, 2009) ISBN 0778744337

17. *What Happens When You Move?*, by Jacqui Bailey (The Rosen Publishing Group, 2009) ISBN 9781435826175

The Nervous System

18. *The Astounding Nervous System*, by John Burstein (Crabtree Publishing Company, 2009)

19. *The Brain*, by Seymour Simon (Collins, 2006) ISBN 9780060877194

20. *The Nervous System*, by Kay Manolis (Children’s Press, 2009) ISBN 1600412451

21. *The Nervous System (Early Bird Body Systems)*, by Joelle Riley (Lerner Publications Company, 2006) ISBN 0822525216

22. *The Nervous System*, by Christine Taylor-Butler (Children’s Press, 2008) ISBN 0531207358

23. *Touch (A True Book)*, by Patricia J. Murphy (Children’s Press, 2003) ISBN 0516269720

24. *Your Brain*, by Terri DeGezelle (Capstone Press, 2002) ISBN 073683351X

Other Human Body Systems

25. *The Amazing Circulatory System*, by John Burstein (Crabtree Publishing Company, 2009) ISBN 9780778744313
26. *The Circulatory System*, by Kristin Petrie (ABDO Publishing Company, 2007) ISBN 9781596797093
27. *The Digestive System*, by Christine Taylor-Butler (Scholastic, Inc., 2008) ISBN 0531207315
28. *The Digestive System*, by Kirstin Petrie MS, RD (ABDO Publishing Company, 2007) ISBN 159679710X
29. *The Digestive System (Early Bird Body Systems)*, by Rebecca L. Johnson (Lerner Publications Company, 2005) ISBN 0822512475
30. *The Dynamic Digestive System: How Does My Stomach Work?*, by John Burnstein (Crabtree Publishing Company, 2009) ISBN 9780778744290
31. *Food and Digestion*, by Andrew Solway (Sea-to-Sea Publications, 2012) ISBN 9781597712644
32. *Gurgles and Growls: Learning About Your Stomach*, by Pamela Hill Nettleton (Picture Window Books, 2004) ISBN 9781404805040
33. *Guts: Our Digestive System*, by Seymour Simon (HarperCollins Publishers, 2005) ISBN 0060546514
34. *The Heart: Our Circulatory System*, by Seymour Simon (Collins, 2006) ISBN 0060877219
35. *The Heart and Circulation*, by Carol Ballard (Arcturus Publishing, 2005) ISBN 0749659645
36. *Lungs: Your Respiratory System*, by Seymour Simon (Collins, 2007) ISBN 0060546549
37. *The Quest to Digest*, by Mary K. Corcoran (Charlesbridge, 2006) ISBN 1570916640
38. *The Remarkable Respiratory System*, by John Burstein (Crabtree Publishing Company, 2009) ISBN 9780778744306
39. *The Respiratory System*, by Susan Glass (Perfection Learning Corporation, 2004) ISBN 0756944600

40. *The Respiratory System*, by Kristin Petrie (ABDO Publishing, 2007) ISBN 9781596797130
41. *The Respiratory System (A True Book)*, by Darlene Stille (Children's Press, 1997) ISBN 0516262769
42. *Smoking*, by Dr. Alvin Silverstein, Virginia Silverstein, and Laura Silverstein Nunn (Franklin Watts, 2003) ISBN 0531162397
43. *Squirt*, by Trudee Romanek (Kids Can Press, 2006) ISBN 9781553377771
44. *What Happens to a Hamburger?*, by Paul Showers (HarperCollins Publishers, 2001) ISBN 0064451836
45. *Where Does Your Food Go?*, by Wiley Blevins (Scholastic, Inc., 2003) ISBN 0516258605

Vision and Hearing

46. *Eyes and Ears*, by Seymour Simon (HarperCollins Publishers, 1998) ISBN 0060733020
47. *Hearing (A True Book)*, by Patricia J. Murphy (Children's Press, 2003) ISBN 0516269704
48. *How Sight Works*, by Sally Morgan (The Rosen Publishing Group, 2010) ISBN 9781615325535
49. *Now Hear This!*, by Melissa Stewart (Marshall Cavendish Corporation, 2010) ISBN 9780761441618
50. *The Sense of Hearing*, by Elaine Landau (Children's Press, 2009) ISBN 0531218325
51. *The Sense of Sight (The Senses)*, by Mari Schuh (Bellwether Media, 2008) ISBN 1600140718
52. *The Sense of Sight*, by Ellen Weiss (Children's Press, 2009) ISBN 0531218333
53. *Sight (A True Book)*, by Patricia J. Murphy (Children's Press, 2003) ISBN 0516269682
54. *What Is Hearing?*, by Jennifer Boothroyd (Lerner Publishing Group, Inc., 2010) ISBN 9780761350149
55. *What Is Sight?*, by Jennifer Boothroyd (Lerner Publishing Group, Inc., 2010) ISBN 9780761350156

56. *Why Do We See Rainbows?*, by Melissa Stewart (Marshall Cavendish Corporation, 2009) ISBN 9780761429197

Taking Care of Your Body

57. *Eat Healthy, Feel Great*, by William Sears, M.D., Martha Sears, R.N., and Christie Watts Kelly (Little, Brown and Company, 2002) ISBN 0316787086

58. *Eating Well (Looking After Me)*, by Liz Gogerly and Mike Gordon (Crabtree Publishing Company, 2009) ISBN 0778741176

59. *The Edible Pyramid: Good Eating Every Day*, by Loreen Leedy (Holiday House, 1994) ISBN 9780823420742

60. *Good Enough to Eat: A Kid's Guide to Food and Nutrition*, by Lizzy Rockwell (HarperCollins Publishers, 1999) ISBN 0064451747

61. *Healthy Eating*, by Claire Llewellyn (QEB Publishing, 2006) ISBN 1595661920

62. *Healthy Eating (Science Everywhere!)*, by Helen Orme (New Forest Press, 2010) ISBN 1848982895

63. *How to Stay Healthy (I Know That!)*, by Claire Llewellyn (Sea-to-Sea Publishing, 2007) ISBN 1597710244

64. *My Food Pyramid: Eat Right. Exercise. Have Fun.*, by Alisha Niehaus (Dorling Kindersley Limited, 2007) ISBN 9780756629939

65. *My Healthy Body*, by Bobbie Kalman (Crabtree Publishing Company, 2010) ISBN 9780778794714

66. *Oh, the Things You Can Do That Are Good For You!*, by Tish Rabe (Random House, Inc., 2001) ISBN 0375810986

Websites

General Human Body Systems

1. How the Human Body Works (various systems)
http://kidshealth.org/kid/htbw/htbw_main_page.html
2. The Virtual Body
<http://www.medtropolis.com/VBody.asp>
3. Human Body Systems Game
<http://sciencenetlinks.com/media/filer/2011/10/13/allsystems.swf>

4. A Ride Through the Human Body
<http://www.healthexplorationstation.com/fun/hes2.htm>

Skeletal and Muscular System

5. How Does Your Body Move?
<http://www.bonesandharry.co.uk/main/main.html>

Nervous System and the Brain

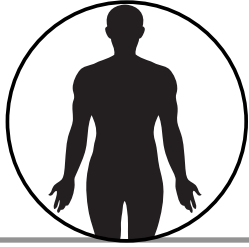
6. Your Brain and the Nervous System
<http://kidshealth.org/kid/htbw/brain.html>
7. Reaction Time Experiment (ZOOM Kids)
<http://pbskids.org/zoom/activities/sci/reactiontime.html>
8. Sensitivity Tester Experiment
<http://pbskids.org/zoom/activities/sci/sensitivitytester.html>

Sense of Sight

9. Optics for Kids
http://www.opticalres.com/kidoptx_f.html
10. Nearsightedness Simulation
<http://www.eyeland-design.com/webtools/53828496ca1045c06/53828496bd08d7c0c/index.html>
11. Farsightedness Simulation
<http://www.eyeland-design.com/webtools/53828496ca1045c06/53828496bd08b1006/index.html>

Sense of Sound

12. How the Human Ear Works
<http://www.sciencekids.co.nz/videos/humanbody/ear.html>
13. National Institute on Deafness and Other Communication Disorders (student and teacher activities)
<http://www.nidcd.nih.gov/health/education/teachers/Pages/Default.aspx>
14. What's That Sound?
<http://www.dangerousdecibels.org/virtualexhibit/1whatsthatssound.html>



Building Blocks and Systems

1

✓ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Briefly describe and/or review seven of the systems of the human body
- ✓ Explain that the human body includes the following systems and identify the function of each: skeletal, muscular, and nervous
- ✓ Identify cells as the basic building blocks of all living things and explain that most cells are too small to be seen without a microscope
- ✓ Explain the relationship between cells, tissues, organs, and systems
- ✓ Explain that each system is made up of different types of cells (bone cells, muscle cells, nerve cells, blood cells, etc.)

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe the relationship between cells, tissues, organs, and systems using language that pertains to time, sequence, and cause/effect (RI.3.3)
- ✓ Describe images of the human body systems and how they contribute to what is conveyed by the words in “Building Blocks and Systems” (RI.3.7)
- ✓ Interpret information from a KWL (Know Wonder Learn) chart created in *The Human Body: Systems and Senses* (RI.3.7)
- ✓ Compare and contrast human bodies and complex machines, as discussed in “Building Blocks and Systems” (RI.3.9)

- ✓ Make personal connections (orally or in writing) to “Building Blocks and Systems” by describing some of the ways various systems are working in one’s own body (W.3.8)
- ✓ Categorize and organize facts and information related to “Building Blocks and Systems” (W.3.8)
- ✓ Distinguish the literal and nonliteral meanings of phrases, such as “building blocks,” as used in “Building Blocks and Systems” (L.3.5a) (RI.3.4)
- ✓ Provide and use synonyms for the word *interconnected* (L.3.5b)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

cells, *n.* The smallest units that make up living things and that are most often microscopic

Example: The human body is made up of trillions of tiny cells, most of which are too small to be seen by the naked eye.

Variation(s): cell

circulate, *v.* To move around in a loop or circle

Example: The steam and heat circulate through the pipes, keeping the room warm and cozy.

Variation(s): circulates, circulated, circulating

functions, *n.* The actions or activities that something was designed to do

Example: A dictionary has many functions, but I use it most often to check the definition of a word.

Variation(s): function

interconnected, *adj.* Having connections or things that are related to one another

Example: The house’s electrical system and heating system are interconnected, so if the power goes out, the heating system will not work.

Variation(s): none

organs, *n.* Major parts of the body formed by many tissues that perform specific functions

Example: Tobias donated one of his organs, a kidney, to his cousin Paul in order to help Paul’s body function better.

Variation(s): organ

systems, n. Groups of items or things that are connected and work together as a single item to achieve a particular result


Example: Both the railroad and highway systems made it easier for Americans to travel around the country.

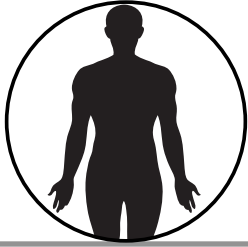
Variation(s): system

tissues, n. Masses of cells that have a specific structure and come together to form organs

Example: The doctor studied the connective tissue of his patient to figure out why he had knee joint pain.

Variation(s): tissue

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Do We Know?	Poster 1 (Human Body Systems)	10
	Domain Introduction	chart paper [This exercise requires advance preparation.]	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Building Blocks and Systems	Poster 2 (Building Blocks of the Human Body); Image Card 1	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	Poster 2	15
	Word Work: Interconnected		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Image Review	Posters 1 and 2	20
	KWL Chart	Instructional Master 1B-1 (optional)	
<i>Take-Home Material</i>	Family Letter	Instructional Masters 1B-2 and 1B-3	



Building Blocks and Systems

1A

Introducing the Read-Aloud

10 minutes

What Do We Know?

Note: Students who have participated in the Core Knowledge Language Arts program have been introduced to the five senses; the basic functions, building blocks, and systems of the human body; and food and nutrition through the following domains: *The Five Senses* (Kindergarten), *The Human Body* (Grade 1), and *The Human Body: Building Blocks and Nutrition* (Grade 2). In *The Human Body* domain from Grade 1, students learned about the skeletal, muscular, nervous, digestive, and circulatory systems. In Grade 2, students learned about the digestive and excretory systems. Please note that the excretory system includes only fluid waste (i.e., sweat, urine, moisture expelled in the breath), and is not to be confused with the solid waste of the digestive system.

Show students Poster 1 (Human Body Systems) and read the title of today’s read-aloud: “Building Blocks and Systems.” Remind students that titles of books and stories often foreshadow, or give a hint or clue about, what they will be reading or hearing. Ask students what they think they will be learning about based on the title and poster. Tell students that over the next few weeks, they will be learning about the human body, its many interconnected systems, and how these systems are related to our senses. Ask students if they are familiar with any human body systems, asking them to explain what a system is. (a group of items or things that are connected and work together as a single item to achieve a particular result)

Ask students if they think their human body is simple, or if it’s like a complex machine made up of many different parts. Ask students, “Can you think of any complex machines?” Give students the example of a bicycle, asking them what would happen if one part of the bike, like the chain, failed to work properly. Tell students that many of the human body’s functions take place internally, inside our bodies. Explain that many complex systems are working together in our bodies without us really paying attention to them. Tell students to sit very still and quiet and

encourage them to feel their heartbeat. Ask students, “Do you have to think to make your heart beat, or does your body do it automatically?”

Domain Introduction

Tell students they will learn about how the human body works, and review different ways to keep their bodies healthy. Ask students why it is important to take care of their bodies and keep them healthy. Tell students that they will be learning mostly about three of the human body systems—the skeletal, muscular, and nervous systems, and how they work together to help the human body function. Explain that there are more systems in the human body, but for now—with the exception of a brief overview and review of some other systems—they are going to learn mainly about these three. Tell students they will learn more about human body systems in later grades.

Make a **KWL** (**K**now, **W**onder, and **L**earn) chart to introduce this domain. Use multiple pieces of chart paper so that you can add more information to the chart as students listen to the various read-alouds. This chart will be used throughout the read-alouds to determine what your students may already know (K), what they wonder or want to know (W), and what they have learned (L) about the various human body systems.

Note: You may choose to assign each system and sense its own piece of chart paper for the KWL chart, as designed on the instructional master, or you may assign all of the ‘K’ items to one piece of paper, all of the ‘W’ items to another, and so on.

Make three columns labeled ‘K,’ ‘W,’ and ‘L’ on the pieces of chart paper, dedicating one piece of chart paper to each system and sense. Prior to recording the students’ responses, point out that you are going to write down what they say. Give students the opportunity to share anything they already know about how their bodies work, and how the different body systems work together. As students respond, repeat and expand upon each response using richer and more complex language, including, if possible, any read-aloud vocabulary. Record students’ responses under the ‘K’ of the KWL chart. If a student’s response includes inaccurate factual information, record it nonetheless and revisit and correct the misconception once the correct factual information has been presented.

Then ask students, “What are some of the things that you want to know or that you wonder about the human body?” Record their responses under the ‘W’ of the KWL chart. Tell your students that after they have listened to some of the read-alouds in this domain, they will have a chance to share what they have learned. These answers will be listed under the ‘L’ portion of the chart. As students listen to the upcoming read-alouds, remind them occasionally of the ‘W’ to see if they can find answers to some of their questions as the read-alouds are shared.



← **Show image 1A-1: Ricardo and Dr. Welbody in doctor’s office**

Ask students if they remember Dr. Welbody, the rhyming pediatrician from the Grade 1 domain *The Human Body*. Tell students that they will be learning about the human body through a narrator named Ricardo, who loves to tell riddles about the human body. Ask students to explain what a riddle is, and if time allows, give an example and/or have students share one or two riddles they know.

Purpose for Listening

Tell students to listen carefully to the read-aloud to hear a little bit about the skeletal, muscular, nervous, digestive, circulatory, respiratory, and excretory systems. Remind students that they will be hearing riddles about each of these systems, so tell students to listen carefully to guess the correct answers. Also, tell students to listen carefully to find out about the building blocks of the human body.



Building Blocks and Systems

← Show image 1A-1: Ricardo and Dr. Welbody in doctor's office

Hello everybody. I'm Ricardo. I'm in the fourth grade, and I am fascinated by the human body and its complex, **interconnected systems**. I hope to continue to learn about the human body in great detail and become a doctor someday.

Dr. Welbody is a friend of mine. Who remembers Dr. Welbody? She's the rhyming pediatrician whom some of you may have met when you were in first grade. Dr. Welbody taught you about your body, using several rhymes like this one:

Everybody has a body

And I have one, too.

It is grand to understand

The things our bodies do.

Dr. Welbody just happens to be my very own pediatrician. She's also one of my teachers—not the kind of teacher you find in a school—but because she's taught me so much about my body. She has asked me to come share a little of what I've learned with you. Thanks for welcoming me. I can't wait!



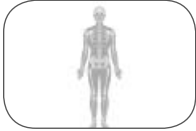
← Show image 1A-2: A group of people together, a network of systems

Our bodies are often compared with machines. That comparison may seem strange to you at first, because machines are nonliving objects, and our bodies are very much alive. But, think about it—machines are made up of networks.¹ Human body systems include lots of different parts working together to perform very special jobs. Dr. Welbody says that our bodies are the most marvelous machines on Earth, and I think you will agree with her once we review how our bodies work.

Just as Dr. Welbody loves rhymes, I love riddles! So, expect to hear a lot of riddles from me. Let's begin our lesson with one now:

1 or groups of complex, interconnected systems

2 [Pause for students to answer.]



*I am as strong as a tree trunk, but, with a little help from other human body systems, I can bend in many directions. I give your body its shape. What am I?*²

← **Show image 1A-3: The skeletal system**

It is your skeleton. Does anyone know which system of the body includes your skeleton? Your skeletal system, that bony system that supports you and protects important **organs** inside your body. The skeletal system is only one of many systems working together in your body.

Now, I'm going to ask you some more riddles. See if you can match the riddle to the right body system. Ready? Let's go:

3 [Pause for students to answer.]



*I'm the system that makes your bones move. I also help you blink and swallow. What system am I?*³

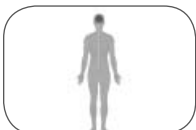
← **Show image 1A-4: The muscular system**

The muscular system is made up of muscles. Muscles are the motors of the human machine, and they keep your body moving in lots of different ways. Some are attached to your bones to help you run and throw a ball. Others line the walls of the stomach, squeezing in and then relaxing to help digest your food. Small muscles in your face help you smile. Your strongest and most important muscle, your heart, works nonstop, pumping blood throughout your body, day and night.

Here's the next riddle:

*Without me, you would not be able to feel, or see, or hear. I control your senses by sending messages to my command center, the brain. What system am I?*⁴

4 [Pause for students to answer.]



← **Show image 1A-5: The nervous system**

The nervous system is your body's communicator. It tells your body what to do. Nerves run throughout your body, from head to toe, like a giant road system. Nerves send messages up and down your spine to your brain. The nervous system controls your muscles, telling them how to move. It also helps all your other systems do their jobs.

Here's your next riddle:

*I work like a food-processing machine. You put food in your mouth, and I churn it up for the rest of your body to use as fuel. What system am I?*⁵

5 [Pause for students to answer.]



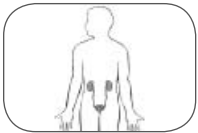
← **Show image 1A-6: The digestive system**

The digestive system helps you digest, or break down, your food. It splits your food into nutrients, giving your body energy to live and grow. Food enters your mouth and travels down a long tube called the esophagus, all the way to the stomach and the intestines. It takes food nearly two days to pass all the way through your body.

Ready for another riddle?

*I work like a water filter, getting rid of harmful substances in the liquid that passes through your body. I excrete them, or push them out of the body. What system am I?*⁶

6 [Pause for students to answer.]



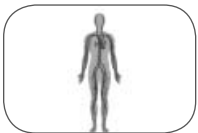
← **Show image 1A-7: The excretory system**

The excretory system excretes, or gets rid of, liquids such as sweat and urine that may be harmful to the body. Your skin, the largest organ of the body, excretes sweat through its many pores. A pair of organs called the kidneys filter harmful substances and extra water from the blood and send them to your bladder. Your bladder looks like a bag, holding excess fluid, or urine, until it is ready to pass out of your body.

Here's another riddle:

*I am your body's delivery system. I deliver nutrients and oxygen to all parts of your body. Nutrients and oxygen **circulate**, or are carried throughout the body by blood vessels. The heart acts as my pump. What system am I?*⁷

7 [Pause for students to answer.]



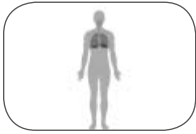
← **Show image 1A-8: The circulatory system**

The circulatory system is made up of your heart, blood vessels, and blood. Blood enters your heart and is pumped into a large blood vessel. Blood vessels carry blood to every part of your body and loop back again. This circulation of the blood, carrying nutrients and oxygen, happens all day and all night.

Here's the last riddle for now:

*I carry oxygen to your blood. Without oxygen, you cannot live. I also get rid of the gas carbon dioxide that the body does not need. I help you breathe. What system am I?*⁸

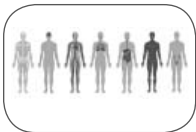
8 [Pause for students to answer.]



← **Show image 1A-9: The respiratory system**

9 You may have learned about the muscle below the lungs that makes room for the lungs to expand when you breathe in oxygen. Who can tell me the name of this muscle? (diaphragm)

The respiratory system brings air, filled with oxygen, into your body. You can live without food for days, but you cannot live for more than a few minutes without oxygen. You breathe in air through your mouth and nose, and exhale a gas called carbon dioxide. Air travels through a tube into your lungs, the organs that take up most of your chest. Your lungs take in the oxygen that keeps you alive.⁹



← **Show image 1A-10: The interconnected human body systems**

10 [Point to each system as you read the following sentence.]

11 [Show Poster 2 (Building Blocks of the Human Body). Point to the organs, tissues, and cells in the poster as you read the following paragraphs.]

Wow, everybody, you've identified seven of the body's systems!¹⁰ Let's see if you can name all seven with me: skeletal, muscular, nervous, digestive, excretory, circulatory, and respiratory. Now, it's time to find out what all these systems have in common.¹¹

The systems of the human body are organ systems. Each system is made up of organs, parts of the body with clearly defined **functions**. For example, your stomach is an organ. Your stomach works closely with other organs—your mouth, your esophagus, your liver, and your intestines. These organs are all parts of your digestive system. Each one of these organs has a specific function to perform as part of your digestive system's overall job, breaking down your body's food.

Organs are made up of **tissues**. Tissues are masses of **cells** that have a specific structure and come together to form organs. There are many different types of tissues, including muscle, bone, skin, blood, and nerve tissue. Each different type of tissue is made up of different groups of similar cells that do the same jobs. All body tissues are made up of cells. What exactly are cells?¹²

12 [If you taught *Classification of Animals*, you may wish to ask a volunteer to review cells, or building blocks of the body, before continuing.] Parts within cells help scientists classify living organisms.

Cells are tiny building blocks, so tiny in fact that nobody even knew what they were or that they existed until microscopes were

13 [Show Image Card 1 (Types of Cells). Point to each type of cell as you read the following section.]

invented about four hundred years ago. Microscopes magnify cells, making them big enough to see and study. Your body contains trillions of cells.¹³

Cells come in all shapes and sizes, depending upon the jobs they must perform. For example, red blood cells look like bagels with dents instead of holes. They travel through your blood, carrying important nutrients all over your body. Skin cells, grouped together in skin tissue, are packed tightly together to form a protective boundary between you and your environment. Your skin is your largest organ. Nerve cells are grouped together in nerve tissue, and often have long extensions that send and receive messages quickly. Muscle cells, grouped together in muscle tissue, look very different, too. They are long and lean, helping the body move as they stretch and shorten.

Each body system is made up of different types of cells. There are over two hundred different types of cells in your body. Everything you do, from breathing to eating to running to sleeping, requires lots of working cells. They are truly the building blocks of your body. Without cells, there would be no body tissues, no body organs, and no body systems. In fact, all living things have cells. There would be no living things on Earth if it weren't for cells!

Cells are alive, and living things do not last forever. Some cells live for only a few days. Others live for years. Some cells become damaged when you get hurt. Others wear out over time, but inside your body's tissues, cells are constantly dividing and multiplying. One cell becomes two cells, two cells become four, four become eight, and so forth. As cells die, the dead cells are replaced with new cells on a daily basis. Isn't the life cycle of cells amazing?



← **Show image 1A-11: Ricardo waving goodbye**

Well, everybody, we're out of time. Today you heard a little about a lot of body systems. Next time I'll be back to give you a peek inside your body. I'm looking forward to discussing the human body systems with you. See you next time!¹⁴



14 [Point to Ricardo's T-shirt.] What do you think Ricardo will talk about next time?

Comprehension Questions



15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** You may wish to have students collect their written responses in a notebook or folder to reference throughout the domain as source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1. *Literal* What makes up the skeletal system? (bones, the skeleton) What is the function of the skeletal system? (It supports the human body and protects important organs in the body.)
2. *Literal* What makes up the muscular system? (muscles) What is the function of the muscular system? (Muscles help the human body move in many different ways.)
3. *Literal* What makes up the nervous system? (nerves, brain) What is the function of the nervous system? (Nerves run all through the human body, sending messages up and down the spine and to and from the brain. The nervous system controls the other human body systems, helping them do their jobs.)
4. *Literal* What is the function of the digestive system? (It helps to break down food, splitting food into nutrients that give the body energy to help it live and grow.) What is the function of the excretory system? (It helps get rid of liquids, such as urine and sweat, that may be harmful if they stay in the human body.)
5. *Literal* What is the function of the circulatory system? (The pumping of the heart circulates the nutrients and oxygen in the blood all around the body through blood vessels.) What is the function of the respiratory system? (It helps bring oxygen into the human body and gets rid of a gas called carbon dioxide.)

6. *Inferential* What are organs? (parts of the body that have specific functions and that form systems) What are examples of organs you heard about in the read-aloud? (heart, lungs, stomach, etc.)
7. *Inferential* [Show Poster 2 (Building Blocks of the Human Body).] What is each organ in the human body made of? (tissues composed of cells that do the same job) Are all tissues and cells the same? (no) What are some examples of the different types of cells that make up the different kinds of tissues? (Skin cells make up skin, the largest organ in the human body; muscles cells create muscle tissue; blood cells create blood; etc.)
8. *Inferential* What are the building blocks of the body? (cells) Are cells living or nonliving? (living) How do you know? (Cells are the building blocks of life, and cells are only found in living things. Cells are living and constantly dividing and multiplying; they can also die.)
9.  *Evaluative* Why are human bodies compared to complex machines? (The human body, like a complex machine, is composed of several different systems that do specific jobs. These different systems have many different, interconnected parts and need to work together in order to function properly.)
10.  *Evaluative* Compare and contrast human lungs to fish gills. (Both take in oxygen which is necessary for survival; lungs get oxygen from the air, whereas gills get oxygen from the water.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

11.  *Evaluative* **Think Pair Share:** What are some of the ways the various systems are working in your body at this moment? (Answers may vary.)
 12. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Interconnected

5 minutes

1. In the read-aloud you heard Ricardo say, "I'm in the fourth grade, and I am fascinated by the human body and its complex, *interconnected* systems."
2. Say the word *interconnected* with me.
3. *Interconnected* refers to connections or things that are related to one another.
4. The fish in the ocean are interconnected, so that if one type becomes extinct, it has an effect on the other types of fish in the ocean.
5. What are some other things that are interconnected? Be sure to use the word *interconnected* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students' responses to make complete sentences: "_____ is interconnected with . . ."]
6. What's the word we've been talking about? What part of speech is the word *interconnected*?

Use a *Synonyms and Antonyms* activity for follow-up. Directions: I am going to say several words that are either synonyms or antonyms of the word *interconnected*. If the word I say is a synonym of, or has a similar meaning to, *interconnected* say, "_____ is a synonym of *interconnected*." If the word I say is an antonym of, or means the opposite of, *interconnected* say, "_____ is an antonym of *interconnected*."

1. related (*Related* is a synonym of *interconnected*.)
2. separate (*Separate* is an antonym of *interconnected*.)
3. linked (*Linked* is a synonym of *interconnected*.)
4. joined (*Joined* is a synonym of *interconnected*.)
5. unrelated (*Unrelated* is an antonym of *interconnected*.)



Complete Remainder of the Lesson Later in the Day



Building Blocks and Systems

1B

Extensions

20 minutes

Image Review

As a class, review the flip book and posters presented in the “Building Blocks and Systems” read-aloud. Review the different human body systems, prompting students to recall one or two facts about each system. You may also choose to review the riddles, encouraging students to come up with their own riddles based on any new information they learned about the different human body systems and about cells as the building blocks of life.

KWL Chart (Instructional Master 1B-1, optional)

Revisit the KWL chart started in the introduction to record vocabulary and concepts from this domain. Remind students that this chart will be used throughout the domain for each of the different human body systems. Review the ‘K’ section of the chart and correct any inaccurate information.

Then ask students to share what they have learned now that they have heard one read-aloud. Record these answers under the ‘L’ portion of the chart. As students listen to the upcoming read-alouds, remind them occasionally of the ‘W’ to see if they can find answers to some of the questions as the read-alouds are shared.

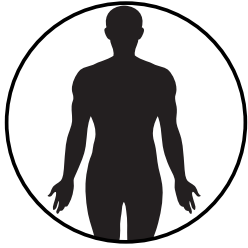
You may have students work in groups or with a partner to record (drawing and/or writing) information learned about each human body system.

- ✈ You may wish to have some students fill in the instructional master independently. You may also choose to allow students to complete research to answer some of the ‘W’ questions.

Take-Home Material

Family Letter

Send home Instructional Masters 1B-2 and 1B-3.



The Skeletal System

Axial Bones

2

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✓ Explain that the human body includes the following systems and identify the function of each: skeletal, muscular, and nervous
- ✓ Explain that one of the systems of the human body is the skeletal system and that it has two parts
- ✓ Recall that there are 206 bones in the human body
- ✓ Identify examples of axial bones and explain their functions
- ✓ Explain briefly the composition of bones

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe the relationship between cartilage and bone using language that pertains to time, sequence, and cause/effect (RI.3.3)
- ✓ Describe images of axial bones and how they contribute to what is conveyed by the words in “The Skeletal System: Axial Bones” (RI.3.7)
- ✓ Interpret information from a KWL chart created in *The Human Body: Systems and Senses* (RI.3.7)
- ✓ Compare and contrast the axis of Earth to the axial bones of the human body and compare and contrast the human body’s structure to a building’s structure as discussed in “The Skeletal System: Axial Bones” (RI.3.9)
- ✓ Categorize and organize facts and information related to “The Skeletal System: Axial Bones” (W.3.8)

- ✓ Make predictions prior to “The Skeletal System: Axial Bones” about how many bones are in the human body and then compare the actual outcomes to predictions (SL.3.1a)
- ✓ Use a known root word as a clue to the meaning of an unknown word with the same root, such as *axis* and *axial* (L.3.4c)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

axial bones, n. The bones that are located down the center, or axis, of a vertebrate’s body

Example: The axial bones support the human body; they help form an axis for the body, a line that goes through the center.

Variation(s): axial bone

cartilage, n. Strong, elastic tissue that can be found in places like the tip of the nose and the top of the ear

Example: Sharks have a frame made completely of cartilage, and this helps them swim quickly because cartilage is lighter than bone.

Variation(s): none

cranium, n. The skull; the hard bones that protect the brain and give the head its shape

Example: Igor was always sure to wear a helmet while riding a bike to protect his cranium in case of an accident.

Variation(s): craniums

marrow, n. The soft tissue that is found inside bones and that is the main source of blood cells, including white blood cells

Example: When people have low amounts of bone marrow, they get sick more easily because there are not enough white blood cells being formed to fight illness.

Variation(s): none

spinal column, n. The backbone; the series of vertebrae that extend from the neck to the tailbone

Example: The spinal column provides necessary protection for the spinal cord.

Variation(s): spinal columns

structure, n. A form or shape; something that is made up of a number of parts arranged together


Example: The building’s structure was put up quickly, but carefully, so it would not collapse.

Variation(s): structures

vital, adj. Necessary for life; extremely important

Example: Both sunlight and water are vital for the growth of most plants.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?		10
	What Do We Know?	KWL Chart	
	Essential Background Information or Terms	chart paper, chalkboard, or whiteboard	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	The Skeletal System: Axial Bones		20
<i>Discussing the Read-Aloud</i>	Comprehension Questions		15
	Word Work: Structure		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	KWL Chart	Instructional Master 1B-1 (optional)	20
	Image Review: Axial Bones	Image Cards 2–5	



The Skeletal System

Axial Bones

2_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Briefly review the systems discussed in the previous read-aloud, using any image supports. Remind students that in the previous read-aloud, they briefly heard about the skeletal system. Ask students, “What is the skeletal system made up of?” (bones, the skeleton) Have students explain why the skeletal system is important to the human body. (The skeleton supports the human body, and it protects important organs in the human body.) Review that cells are the building blocks of life. Ask students to share any information they recall about the cells, tissues, and organs in their body. Emphasize that the various human body systems are interconnected, and that they all need to be healthy and work together; otherwise, the human body does not function properly.

What Do We Know?

Remind students that in the *Classification of Animals* domain, they learned about a few ways in which animals are classified. One way scientists group animals is by whether or not animals have backbones. Ask students, “What are animals with backbones called?” (vertebrates) Ask, “What are animals without backbones called?” (invertebrates) Ask students if humans and other mammals are vertebrates or invertebrates. Now ask students what they remember about exoskeletons, and then have a few volunteers name some animals which have this hard protective covering. (beetles and other insects, crustaceans such as crabs and crayfish) Ask students, “Do we have an exoskeleton?”

Note: You may wish to record this information under the ‘K’ section of the KWL Chart.

Essential Background Information or Terms

Tell students that today they will be hearing a special term that relates to the skeletal system. Say the word *axial*, having students repeat the word after you. Write the word *axial* on a piece of chart paper, a chalkboard, or a whiteboard. Ask students what word they see and/or hear in the word

axial. (axis) Remind students that they may have learned about Earth's axis in several previous domains from earlier grades, and ask a volunteer to explain what an axis is. (an imaginary, straight line that goes through the center of an object, dividing it equally into two parts) Tell students that the axial bones in the human body are bones that are located up and down the middle of the body. Have students feel for these axial bones on their own torsos and heads, asking them to describe what they feel. Tell students they will be hearing more detail about the skeletal system's axial bones in the read-aloud.

Purpose for Listening

Tell students to listen carefully to learn more about the axial bones in the skeletal system. Ask students to predict how many bones are in the human body, and tell students to listen carefully to find out the correct number.



The Skeletal System: Axial Bones

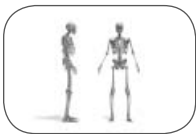
← **Show image 2A-1: Ricardo**

Hi, everybody. Ricardo here—I’ve got a new riddle for you:
*We are a column of bones, stacked on top of one another.
 Collectively, we make up your backbone. We begin with the
 letter ‘v.’ What are we?*¹

1 [Pause for students to answer.]
 (vertebrae)

Today we’re going to talk about the system that gives your body its **structure**, allowing it to stand on its own. If you’ve ever seen a building being built, you know that it has a framework that gives the building its shape and keeps it from toppling over. Your body has a similar structure. Who knows what keeps your body from collapsing?² That’s right—your skeleton!

2 [Pause for students to answer.]



← **Show image 2A-2: The human skeleton**

Your skeleton is made of bones. Bones can support a lot of weight, but they did not start out that way. Before you were born, your skeleton began as **cartilage**, a firm rubbery tissue like the tough gristle on a piece of meat. Touch the top of your ear. What you feel is cartilage. The top of your ear will always be cartilage, but much of the cartilage in your original skeleton hardened and turned to bone.

By the time you were born, you had about 300 bones in your body. An adult has about 206 bones. So, where did all the extra bones go? Do bones just disappear?³ No, they grow and change over time. Many of them join together, like those at the end of your spine called the tailbone or the bones in your skull.

3 [Pause for students to answer.]



← **Show image 2A-3: Dairy products and metallic calcium**

Have you ever heard the saying “hard as rock”? Rocks are hard due to the minerals stored inside them. The outside part of your bones becomes hard by storing minerals, too. Minerals enter your body in the food you eat and the vitamins you may take. Calcium, contained in dark, leafy greens, broccoli, and dairy products, such

as milk, is one of the important minerals that makes your bones as hard and strong as rock on the outside. Calcium is also needed to help blood clot, or thicken, when you accidentally cut yourself. Without it, your blood would be too thin for you to maintain good health.

At least until you reach your full height, your bones will continue to grow with you. It's hard to imagine rock-hard bones growing, isn't it? They cannot stretch or bend. So, how *do* bones grow? Well, bones are made up of living tissue. New bone tissue is being made all the time, working to replace worn-out cells and making it possible to heal broken bones.



← **Show image 2A-4: Bone marrow**

Before you were born, your bones were solid, but many of them have become hollow over time, making them very light, yet still very strong. This is how bones *differ* from rocks. Rocks are solid all the way through, but bones are porous, meaning that they have many tiny holes through which liquids pass.⁴ **Marrow**, a jellylike tissue, fills these cavities of your porous bones. Bone marrow is your body's blood cell factory. It produces blood cells to fight infection and carry oxygen throughout your body.⁵

Bones come in many shapes and sizes. Some are long and rod-like with knobby ends. Some are short and look like cubes, whereas others are flat. And some have their own unique shapes. Even though there are many different kinds and sizes of bones, all human skeletons look pretty much the same. Your skeletal bones are designed in specific ways to support and protect every part of your body.

← **Show image 2A-5: Axial bones and individual vertebrae**

There are three groups of bones that form your axial skeleton: the spine, the skull, and the ribs. The bones that support the center of your body are called axial bones. It is also the job of the axial bones to protect the most important organs in your body. You've already learned that taxonomists classify animals in two groups, vertebrates and invertebrates. Who remembers the group in which

4 [Point to the tiny holes in the image.]

5 Remember, the circulatory system carries the blood your heart pumps throughout your body. So, the skeletal system and the circulatory system are interconnected.



6 [Pause for students to answer.]

humans are classified? ⁶ Right—we're vertebrates! Vertebrates are animals with backbones. Your backbone, or spine, is actually more than one bone. It is a column of many bones stacked on top of one another. ⁷

7 [Point out the single vertebra highlighted in the image.]

Bend forward and feel along the middle of your back. Do you remember those little bumps running down your back? As you may have learned in an earlier domain, these are your vertebrae, a series of bones fitted one on top of another to form the **spinal column**, or backbone. Cartilage separates each vertebra, filling in the spaces and cushioning them from one another. Each vertebra has a hole in it, allowing the spinal cord, an important pathway for nerves, to pass through it. Your spinal column protects your spinal cord, in addition to providing the main support for your skeleton. Your spine is only one part of your axial skeleton.

Sit up as straight and tall as you can. Now, look at your neighbor. Does the side profile of your neighbor's spine look straight? Probably not. Your spine is curved, looking more like the letter 'S' than the letter 'I.' Can you think of any reasons why it might be better to have a slight curve in your back, rather than a completely straight back? ⁸ If your back were as straight as a board, you wouldn't be able to bend. The shape of your spine allows you much greater flexibility.

8 [Pause for students to answer.]



← **Show image 2A-6: Human skull showing interlocking bones**

You've already heard about that fabulous tailbone at the lower end of your spine. So, what's at the other end? Use your hand to follow your vertebrae up your back and along your neck to your head. Feel how hard your head is. Who knows the name for the protective group of bones hidden inside your head? ⁹ Right—your skull! Skull bones sit on top of your backbone, becoming the second part of your axial skeleton, that group of bones that support the center of your body.

9 [Pause for students to answer.]

Your skull is comprised of a group of bones—twenty-nine in all! Locked together, they protect your brain and some of your body's sensory organs. The top part of your skull, shaped like a bowl and

surrounding the brain, is called the **cranium**. Eight thin, curved bones are tightly interlocked to form this smooth cranial helmet beneath your forehead and scalp. When you were born, these eight bones still had gaps between them, allowing your brain to grow. Because these gaps don't close completely for about two years, babies have a "soft spot" on their heads and need very careful handling.

The rest of your skull bones are facial bones, or bones in your face. Put your hands over your eyes and touch your closed lids very gently, pushing up slightly toward your eyebrows. The round openings in your skull are called eye sockets. These sockets are deep enough to protect your delicate eyes. Another hole in your skull is just the right size for your nose. Though it is sometimes closed or covered up with teeth, what is the biggest opening in your face? ¹⁰ Right—your mouth. Cover your face with your hands and open your mouth wide. Which bone moved? Your jawbone! Your upper jaw is attached to the rest of your skull, but your lower jaw is hinged so that it can move up and down, and side to side. Pretty amazing, isn't it? ¹¹

10 [Pause for students to answer.]

11 Why do you think it's important for the jaw to be able to move?



← **Show image 2A-7: Rib cage and flexible skeleton**

Does anyone remember the three groups of bones that form the axial skeleton down the center of your body? ¹² The spine is one. The skull is another. The third group of axial bones is also connected to your spine. Reach behind you again and feel the bones that stretch across your back, wrapping around to the front of your body. What are these bones called? ¹³ Right again—your ribs!

12 [Pause for students to answer.]

13 [Pause for students to answer.]

Ribs are curved bones that form a protective cage, called the rib cage, around your heart and lungs. Ribs come in pairs. Each rib is attached to a vertebra in the middle of your back, and the sternum, or breastbone, in the middle of your chest. Feel your chest. Can you count the number of ribs in your rib cage? ¹⁴ How many did you count? You have twenty-four ribs, or twelve pairs, in all.

14 [Allow students time to count and respond.]

I just can't resist sharing a joke with you right now because it fits in so well with what you're learning:

What did the rib cage say to the heart?

Give up?

Gotcha covered!

Your skull and ribs both protect **vital** organs, organs that you cannot live without. However, your ribs are designed very differently from your skull. Whereas your skull is made of solid, interconnected bones without spaces between, there are spaces between each of your ribs. Can anyone guess why it wouldn't work for the rib cage to be one big solid bone? ¹⁵ Take a deep breath, as deep as you can. Now, let the air out. What happens to your chest? Do it again and notice how your chest goes in and out with each breath that you take. Solid bone around your chest would prevent the diaphragm and lungs from expanding properly with the air you breathe. ¹⁶ The shape of the spine, combined with the spaces in between each pair of ribs, helps the human body structure to be flexible.

15 [Pause for students to answer.]

16 As you read the next sentence, point to the flexible skeleton.





← **Show image 2A-8: Ricardo**


I'll be back tomorrow to talk more about the skeleton. Today you learned about axial bones, and tomorrow you'll hear a term that relates to another part of your skeletal system and to your arms and legs. I'm looking forward to the next time we meet! I'll be sure to have new riddles!

Comprehension Questions



15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** You may wish to have students collect their written responses in a notebook or folder to reference throughout the domain as source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1. *Evaluative* Were your predictions about how many bones are in your body correct? Why or why not? (Answers may vary.) How many bones do you have in your body? (about 206 bones)
2.  *Inferential* You heard in the read-aloud that when you were born, you had about three hundred bones in your body. What happened to the bones? (Bones grow and change over time. Many of them joined together, like the skull bones and tailbone.) How do bones heal and grow? (They are made of marrow, living cells, and tissues that replace worn-out cells.)
3. *Inferential* Explain why the skeletal system is so important. (The bones give the human body its structure, allowing it to stand up on its own. It also protects vital organs.)
4. *Inferential* When you were born, were all your bones as strong as they are now? (no) What were some of your bones made out of? (firm, rubbery tissue called cartilage) Name at least one place mentioned in the read-aloud where you still have cartilage in your body. (the top of your ear, the tip of your nose, between the vertebrae)
5. *Literal* Which bones are called your axial bones? (the spine, the skull, and the rib cage)
6.  *Evaluative* Compare and contrast the axis of Earth to the axial bones of the human body. (Both run through the center of something. Bones in your body are real and they support your body, whereas the axis of the earth is an imaginary line. The earth spins around its axis; the human body does not spin around its axial bones.)

7. *Evaluative* How are bones similar to rocks? (They are both hard and strong because they contain minerals.) How are bones and rocks different? (Rocks are solid, or hard all the way through, but bones are only hard on the outside. The inside of bones are porous, or hollow.)
8. *Inferential* Why is it important for bones to be porous? What is inside bones? (Porous bones are lighter, and marrow, a jelly-like tissue, fills the cavities of the bones.) Why is bone marrow important? (It produces blood cells that help to fight infections, carry oxygen throughout the body, and allow bones to grow.) Why is it important to eat calcium-rich foods? (To help keep bones strong with minerals.)
9.  *Inferential* Do all bones look the same? (No, bones come in many shapes and sizes.) Why don't all bones look the same? (They are designed to support and protect different parts of the body.)
10. *Literal* What do the bones in the spinal column protect? (the spinal cord) What vital organs do the bones in the rib cage protect? (the heart and lungs) What does the skull protect? (the brain, the eyes, and other sensory organs)
11. *Inferential* Why are the spaces in between your rib cage and the slight bend of your spine important? (They allow the skeletal system to be flexible.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

12.  *Evaluative* *Think Pair Share:* What characteristics of the skeletal system make it a vital part of the human body? (Answers may vary.)
 13. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Structure

5 minutes

1. In the read-aloud you heard, “Today we’re going to talk about the system that gives your body its *structure*, allowing it to stand on its own.”
2. Say the word *structure* with me.
3. A structure is a form or shape, or something that is made up of a number of parts arranged together.
4. A house built in an area where earthquakes are common should have a structure that will resist the force of an earthquake.
5. In the read-aloud, you heard why it is important for the body to have a strong structure. What are some other things that could not exist without a strong structure? Be sure to use the word *structure* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “Without a strong structure, _____ could not exist.”]
6. What’s the word we’ve been talking about? What part of speech is the word *structure*?

Use a *Sharing* activity for follow-up. Directions: Turn to your partner and take turns sharing ideas about the ways in which the body’s structure is similar to a building’s structure. Also take turns with your partner sharing ideas about the ways in which your body’s structure is different from a building’s structure. I will call on one or two of you to share your ideas with the class. As students share, make sure they use the word *structure* in a complete sentence.



Complete Remainder of the Lesson Later in the Day



The Skeletal System

Axial Bones

2_B

Extensions

20 minutes

KWL Chart (Instructional Master 1B-1, optional)

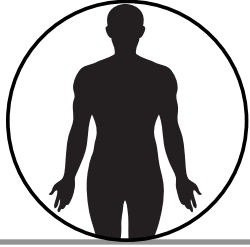
Review any information related to the skeletal system on the chart thus far. Ask if there is any information in the 'K' column that should be revised based on what was learned in the read-aloud. Reread small sections of the text aloud and/or revisit any image supports as necessary to help students check the accuracy of their responses. Then cross out the inaccurate information in the 'K' column. Make necessary revisions. Then ask if students discovered the answers to any of their questions. If so, record relevant answers in the 'L' column. Ask what else students learned from the read-aloud, recording these responses under the 'L' column as well. Tell students that the next time they meet, they will continue to learn about the skeletal system. Ask students if there is anything else they wonder about the skeletal system. Record responses under the 'W' section of the chart.

You may have students work in groups or with a partner to record (drawing and/or writing) information learned about the axial bones in the skeletal system.

- ✈ You may wish to have some students fill in the instructional master independently. You may also choose to allow students to complete research to answer some of the 'W' questions.

10 Axial Bones

Using Image Cards 2–5, review the examples of axial bones discussed in today's read-aloud. You may also wish to review any flip book images, asking students to share what they remember from the read-aloud. As this review is conducted, reinforce domain-related vocabulary whenever possible.



The Skeletal System

Appendicular Bones

3

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✓ Explain that one of the systems of the human body is the skeletal system and that it has two parts
- ✓ Identify examples of appendicular bones and explain their functions
- ✓ Describe how doctors are able to see and treat the skeletal system using an x-ray
- ✓ Identify three different types of joints and give examples of each: movable, immovable, and partially movable
- ✓ Explain the importance and purpose of cartilage

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Determine the main idea of “The Skeletal System: Appendicular Bones”; recount the key details and explain how they support the main idea (RI.3.2)
- ✓ Describe the relationship between cartilage, joints, and bones using language that pertains to time, sequence, and cause/effect (RI.3.3)
- ✓ Describe images of appendicular bones and how they contribute to what is conveyed by the words in “The Skeletal System: Appendicular Bones” (RI.3.7)
- ✓ Interpret information from a diagram of the skeletal system (RI.3.7)

- ✓ Compare and contrast ball and socket joints with hinge joints and compare and contrast movable joints, immovable joints, and partially movable joints as discussed in “The Skeletal System: Appendicular Bones” (RI.3.9)
- ✓ Categorize and organize facts and information related to “The Skeletal System: Appendicular Bones” (W.3.8)
- ✓ Gather information from “The Skeletal System: Appendicular Bones” and take written notes (W.3.8)
- ✓ Make predictions prior to “The Skeletal System: Appendicular Bones” about the largest bone and the strongest joint in the human body and then compare the actual outcomes to predictions (SL.3.1a)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

appendages, n. Smaller body parts that are attached to the main body; things that are attached to, or are a part of, a more significant or important thing

Example: Horseshoe crabs have seven pairs of appendages, some of which they use to gather food.

Variation(s): appendage

appendicular bones, n. Bones that are attached to and hang from the main part of a skeleton

Example: It is more common for people to break their appendicular bones, or bones in their arms and legs, than to break one of the other bones in the body.

Variation(s): appendicular bone

femur, n. The long bone found in the thigh; the thighbone

Example: Henri was lucky that no damage was caused to his femur in the car accident.

Variation(s): femurs

fibula, n. The outer bone next to the tibia, between the knee and the ankle

Example: When the star football player injured his fibula, he had to take a lot of time off to heal.

Variation(s): fibulae, fibulas

joint, n. The area where two bones come together; where two or more things come together

Example: My grandpa says that every time it rains, the joint in his big toe aches.

Variation(s): joints

ligaments, n. Short and tough bands of flexible tissue that connect two bones or pieces of cartilage and hold together joints


Example: My brother has torn ligaments in his leg twice while playing basketball.

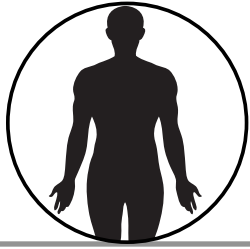
Variation(s): ligament

tibia, n. The inner and larger bone between the knee and ankle; shin bone

Example: When Julianna broke her tibia, she had to wear a cast that extended from her knee to her ankle.

Variation(s): tibiae, tibias

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	KWL Chart	10
	Making Predictions About the Read-Aloud	KWL Chart	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	The Skeletal System: Appendicular Bones	Image Card 6	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions		15
	Word Work: Appendages		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Skeletal System Review	Image Cards 2–12; KWL Chart; Instructional Master 3B-1	20
	Summarizing the Main Ideas	chart paper, chalkboard, or whiteboard	



The Skeletal System

Appendicular Bones

3A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Briefly review the human body systems discussed in previous read-alouds. Review that cells are the building blocks of life. Ask students to share any information they recall about the cells, tissues, and organs in their body. Ask students, “Do our human body systems work independently, or are they interconnected?” Ask students to share what they remember about the bones in their skeletal system. Ask students to recall what term they learned to describe the skull, spine, and rib cage. (axial bones) Ask students, “Why are the skull, spine, and rib cage called axial bones?” (The axial bones in the human body are bones that support the center of the body.) Now say, “Explain why, in addition to supporting the body, the axial bones are important.” (They protect the most important organs in the body.) Ask students why the skeletal system as a whole is important to the human body. (The skeleton is a framework that keeps the body from toppling over.)

Tell students that today they will continue to learn about the skeletal system. Revisit the ‘W’ section of the KWL chart, and ask students if they have anything else they wonder about the skeletal system that they would like to add before hearing the read-aloud.

Making Predictions About the Read-Aloud

Tell students that today they will hear about different types of bones and joints. Ask students to predict what the largest bone in the human body is and where it is located. Ask students to predict what the strongest joint in the human body is and where it is located. You may wish to record their responses on the KWL chart and address the responses during the Discussing the Read-Aloud section.

Purpose for Listening

Tell students to listen carefully to learn about appendicular bones and joints and to hear if their predictions about the largest bone and the strongest joint in the body are correct. Tell students to also listen for the main ideas, or important points, of the read-aloud, and let them know that they will discuss this later.



The Skeletal System: Appendicular Bones

← Show image 3A-1: Ricardo

- 1 [Pause for volunteers, and then write the correct spelling on the board.]

Hello again. Before we begin, I want to know who is able to correctly spell the big ‘v’ word that we talked about the last time we met. Who would like to try to spell *vertebrae*?¹ Wow! I’m impressed.

Today we’re going to talk about another big word: **appendages**. I was quite small the first time I ever heard that word. I used to cling to my mother’s leg all the time, and I would often hear her say, “Ricardo is my little appendage.” I never knew what it meant. Do you? Now, years later, it makes perfect sense to me. An appendage is something that is attached to, or that hangs from, something larger. Today, you are going to learn about the other bones in your skeletal system, the bones in the legs and arms that hang from your axial skeleton. These bones in your appendages are called **appendicular bones**, because they “hang on” to the larger bones of the body. Let’s try saying those words together: *appendicular bones*.



← Show image 3A-2: Highlighted scapulae

- 2 [Pause for students to answer.]

Let’s begin near the top of your skeleton with your arm bones. What are your arms attached to? What do they hang down from?² If you answered *shoulders*, you are right. Your shoulders are made up of several different bones. Look at this picture to see how arm bones are connected to the axial skeleton. The large, flat, triangular bones that you see in the picture are called scapulae, or shoulder blades.³ They are sometimes referred to as “wings” because they stick out a little from your back. Now, look at this picture. The long bones that connect your scapulae to the top of your rib cage are called clavicles, or collarbones. Shirt collars cover your collarbones.⁴

- 3 [Have a student volunteer point to the shoulder blades in the image.] Some of you may remember that the word *vertebrae* is plural for *vertebra*. Do you think the word *scapulae* is singular or plural? (plural) What do you think one shoulder blade is called? (scapula)
- 4 [Show Image Card 6 (Clavicles).] Touch your clavicles with your fingers.

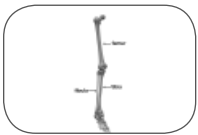


← **Show image 3A-3: Leg bones attached to skeleton**

5 [Pause for students to answer.]

6 [Point to the pelvis in the image.]

Let's move down your body to the base of your axial skeleton. How are your legs attached to your spine?⁵ Legs need a hanger, too. Their hanger is called the pelvis, a group of strong bones illustrated in this picture.⁶ Put your hands on your hips and see if you can feel the bones that stick out at your sides. These are your hip bones, or pelvic bones. Your pelvic bones are large bowl-shaped bones that protect your bladder and intestines—very important organs to help your body function properly. Your pelvis is connected to your spine by the sacrum, a triangular bone that sits between the two hipbones of your pelvis.



← **Show image 3A-4: Tibia, fibula, and femur**

7 Point to your femur and repeat the word *femur* after me.

8 Point to your tibia and fibula and repeat the words *tibia* and *fibula* after me.

Leg bones and arm bones are a lot alike, but leg bones are thicker and longer than arm bones. In fact, the longest, heaviest, and strongest bone in your entire body is in your leg. Does anyone know the name of this bone?⁷ It's your thighbone, or **femur**. Your femur is connected to your pelvis and extends all the way down to your knee. If you look at the picture, you will see two bones in the lower part of the leg.⁸ The larger of the two, the one in the front of the leg is called the **tibia**, or shinbone. The thinner bone behind it is called the **fibula**. Both the tibia and the fibula connect the knee to the ankle.

9 [Pause for students' responses.]

That's a lot of information. I suspect that some of you are wondering how all these different bones are connected. Sure, they're attached to hangers, the scapulae and the pelvis, but how? Are they glued in place?⁹



← **Show image 3A-5: Different types of joints (movable, immovable, partially movable)**

10 [As you read each of the following sentences, point to each different kind of joint.]

The point where two bones meet is called a **joint**. Without joints, your body would not be able to move. There are three main types of joints in your body: movable, immovable, and partially movable. In other words, some joints can move, some can't, and some move a little bit. Let's take a closer look at all three.¹⁰

The most movable joints in your body are ball-and-socket joints. Make a fist with one hand; then, wrap the fingers of your other hand around it. Your fist is like the ball in the socket of your other hand. You can move the fist around easily inside the other hand, can't you? This type of joint is found in both your hips and your shoulders. Ball-and-socket joints allow you to swing your arms and legs in a full circle.

Other movable joints, called hinge joints, work like the hinges of a door. Your jawbone has hinges. Can you think of any other hinge joints in your body, joints that move only back and forth instead of turning in a full circle?¹¹ Your knees, elbows, ankles, wrists, and knuckles all have hinge joints. In fact, your knee joint, connecting your femur to your tibia and fibula, is the biggest and strongest joint in your whole body. It lets your body bend at the knees. Stand up and bend at the knees. Imagine trying to walk without those hinge joints!¹²

Some joints permit no movement at all. These are called immovable joints because they lock bones together, forming solid bone as hard as a turtle shell. Can you think of any axial bones that fit that description?¹³ Yes, your skull is made up of bones that are locked firmly in place, allowing no movement where the bones come together.

The third type of joint in your body is the partially movable kind, the ones that move a little bit, but not nearly as much as ball-and-socket or hinge joints. Can anyone think of an example of a partially movable joint in your body?¹⁴ Remember when you took deep breaths and watched your chest move in and out? The joints where your ribs are joined to your breastbone are a good example of partially movable joints.

11 [Pause for students to answer.]

12 [Have students compare their own ball-and-socket joints with their hinge joints by asking them to spread out a bit and swing an arm (ball-and-socket) and compare that to bending their elbow (hinge.)] What is the difference between the movement? (Ball-and-socket joints move the appendage in more of a circular way; hinge joints move the appendage in a straight back-and-forth movement.)

13 [Pause for students to answer.]

14 [Pause for students to answer.]



← **Show image 3A-6: Cartilage and ligaments**

Remember cartilage, the soft, gristly tissue found in your nose and backbone and between your vertebrae? Cartilage is found at the ends of bones where they connect with joints as well. This smooth, elastic tissue serves an important purpose. Try rubbing your palms together. Do you feel the heat? If bones and joints

rubbed back and forth together like this with nothing in between, your bones would soon wear out. Instead, a smooth, slippery coating of cartilage covers bones where they meet joints, protecting them and helping them to last longer.

That makes me think of a riddle to ask you:

*We are tough straps of strong, elastic tissue that bind bones together. Our name has three syllables and comes from a word meaning “to tie.” What are we?*¹⁵

15 Has anyone figured out the answer? (ligaments)

Cartilage protects your bones from rubbing together, but another connective tissue acts like straps, wrapping around your joints to actually hold your bones together. These thick cords are called **ligaments**.¹⁶ Some are round like ropes; others are flat like ribbons. But they are all extremely stretchy. Has anyone ever told you that he or she is double-jointed? Double-jointed people can bend their fingers farther back than other people, but they don't really have extra joints. The ligaments holding their joints together just stretch farther than normal. Is anyone here “double-jointed”?¹⁷

16 [Point to the ligaments in the image.]

17 [Pause for students to answer.]

Ligaments and other protective tissues help prevent injuries to your bones. Nevertheless, bones still get injured and wear out. Humans are very active. Walking, running, jumping, and playing puts stress on your bones. So, what happens if you break a leg, sprain an ankle, or dislocate a joint? Often, you must see a doctor, and sometimes your doctor will recommend an x-ray. Now that you have lots of information about the skeletal system, both the axial bones and the appendicular bones, let's take a look at this thing we call an x-ray.



← Show image 3A-7: X-Ray

These x-rays are of various parts of a human skeleton. An x-ray is an invisible light that can travel through the soft tissues of your body, but not through hard bone. After an x-ray passes through you, a picture is recorded on photographic film. Soft tissues appear black on the film because the x-ray passes right through them. But, wherever the x-ray is blocked by bone, white areas appear on the picture, allowing doctors to find breaks more easily. X-rays were invented as a medical tool just over one hundred years ago.



← **Show image 3A-8: Ricardo waving goodbye**

The next time we meet we'll discuss another important body system, one that works closely with your skeletal system to move your bones. Turn now and talk to your neighbor. See if you agree on the name of the system I'm talking about. We'll find out next time if you're right!¹⁸

18 [Have students predict which system will be discussed in the next read-aloud. Be sure to point to Ricardo's T-shirt as a clue.]

Discussing the Read-Aloud

20 minutes

Comprehension Questions

15 minutes




If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** You may wish to have students collect their written responses in a notebook or folder to reference throughout the domain as source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1. *Evaluative* Were your predictions correct about the largest bone and the strongest joint? Why or why not? (Answers may vary.) [You may wish to address any misinformation on the KWL chart if notes were taken prior to presenting the read-aloud.]





← **Show image 3A-4: Tibia, fibula, and femur**

2. *Inferential* Locate the following appendicular bones: the femur, tibia, and fibula. [Ask two or three student volunteers to locate these appendicular bones on their bodies.]
3. *Literal* What is an appendage? (something that is attached to and/or hangs from something larger) What are appendages on the human body, and why are they called appendages? (arms and legs, because they “hang on” to or are attached to the larger section or trunk of the body)

4. *Literal* What is the point called where two bones meet? (a joint) What are the three main types of joints? (movable, immovable, and partially movable)
5.  *Inferential* What is the difference between the three types of joints? (Movable joints, like ball-and-socket joints and hinge joints, help different body parts, such as the knees and shoulders, bend easily; immovable joints lock bones in place, like the joints that connect the bones in the skull; partially movable joints, such as the rib cage, allow for some movement, but not as much movement as the movable joints.)
6. *Inferential* Why is cartilage important to the joints? (Cartilage covering the bones at the joints protects the bones, helping them to last longer.) What would happen if there was no cartilage at the joints? (Bones would more easily become worn down.)
7.  *Evaluative* Would ligaments still be able to do their job if the tissues that they are made of were not stretchy and connective? (Answers may vary.)
8. *Literal* How does an x-ray work? (Invisible light from an x-ray passes through tissue, but not bone. The image that the invisible light creates is recorded on film, allowing a doctor to check for many issues related to the bones.)
9.  *Evaluative* Why do you think it is more common to break an appendicular bone than an axial bone? (Appendicular bones are more vulnerable because they are more exposed, used often to move about and play, etc.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

10.  *Evaluative Think Pair Share:* If your body were a tree, which parts of the tree would be your appendicular bones? Which parts would be the axial bones? (Answers may vary but may include that appendicular would include the limbs, branches, and leaves; and axial would include the trunk.)
11. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
 You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Appendages

5 minutes

1. In the read-aloud you heard Ricardo say, “Today we’re going to talk about another big word: *appendages*. I used to cling to my mother’s leg all the time, and I would often hear her say, ‘Ricardo is my little appendage.’”
2. Say the word *appendages* with me.
3. Appendages are smaller body parts attached to the main body.
4. Spiders are able to crawl around quickly with their eight appendages.
5. How many appendages do insects and other animals have? What else can you think of that has appendages? Be sure to use the word *appendages* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “A _____ has _____ appendages.”]
6. What’s the word we’ve been talking about? What part of speech is the word *appendages*?

Use an *Acting and Sharing* activity for follow-up. Directions: Turn to your partner and make a motion with one of your appendages. Ask your partner to describe what you are demonstrating with one of your appendages. For example, you may use your arm to pretend to wave to a friend. You would ask your partner, “What am I doing with one of my appendages?” Your partner would reply, “You are using one of your appendages to wave hello.” I will ask one or two of you to share with the class what action you were demonstrating with one of your appendages. As you share, be sure to use the word *appendages* in a complete sentence.



Complete Remainder of the Lesson Later in the Day



The Skeletal System

Appendicular Bones

3_B

Extensions

20 minutes

10 Skeletal System Review (Instructional Master 3B-1)

As a class, briefly review the skeletal system, including the terms *axial bones* and *appendicular bones*. Using Image Cards 2–12, have students identify the different bones in the skeletal system. You may also review this content by showing images from the read-alouds on the skeletal system again.

Give each student a copy of Instructional Master 3B-1. After students have labeled the parts of the skeleton, have them circle one example of an axial bone and put a square around one example of an appendicular bone. If time allows, have students locate the different types of bones and joints on their own bodies.

Note: You may wish to have some students complete this activity as a class, or have students work in groups or with a partner.

Summarizing the Main Ideas

In this extension you will model for students how to actively listen and take notes by rereading the read-aloud while having them do the following:

- In preparation for this activity, pick out two or three core vocabulary words from the read-aloud you plan to reread, and write them on chart paper, a chalkboard, or a whiteboard.
- Begin by asking a few volunteers to share what they would say the main ideas are regarding the read-aloud you are about to reread. Have students reference Instructional Master 3B-1 and their written responses to comprehension questions, as applicable. This discussion is meant as a review and warm-up for active listening. Point out the core vocabulary words you have chosen and have students read them together chorally. Tell students that as you are rereading, they should be carefully listening, especially when you get to one of the words on the board.

- Tell students that as you read, they will be jotting down notes—words or short phrases that best express the main idea. Be sure to tell them that they should not be writing in complete sentences. You may wish to model and have students follow an outline style. As you read, you may want to slow down or even pause after reading the Guided Listening Supports that follow the core vocabulary words you have chosen.
- When you are finished rereading the read-aloud, have a few volunteers share one or two notes they have taken. Be sure to give feedback to help shape effective notes, and allow students to record any modifications you guide them through.
- Now have students summarize in two or three sentences the main ideas for this read-aloud, using the three core vocabulary words in their sentences.



The Muscular System

4

✔ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Explain that one of the systems of the human body is the muscular system and identify its function
- ✓ Identify skeletal, smooth, and cardiac as three types of muscles in the human body and describe their functions
- ✓ Compare and contrast involuntary and voluntary muscles
- ✓ Explain that skeletal muscles work closely with bones to give the human body mobility
- ✓ Demonstrate familiarity with the legend of the Achilles heel/tendon

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe the relationship between the muscular system, the skeletal system, the digestive system, and the nervous system using language that pertains to time, sequence, and cause/effect (RI.3.3)
- ✓ Interpret information from a KWL chart created in *The Human Body: Systems and Senses* (RI.3.7)
- ✓ Compare and contrast voluntary and involuntary muscles and contrast ligaments with tendons as discussed in “The Muscular System” (RI.3.9)
- ✓ Categorize and organize facts and information related to “The Muscular System” (W.3.8)

- ✓ Make predictions prior to the read-aloud “The Nervous System” about which human body system is controlled by the brain based on an image, and then compare the actual outcomes to predictions (SL.3.1a)
- ✓ Determine the meaning of the new word formed when a known affix is added to a known word, such as *in-* and *involuntary* (L.3.4b)
- ✓ Distinguish literal language from figurative language, such as “Achilles’ heel” as used in “The Muscular System” (L.3.5a) (RI.3.4)
- ✓ Create antonyms beginning with the prefix *in-* and identify the meanings of the antonyms created (L.3.5b)
- ✓ Listen to a variety of texts, including myths

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

cardiac muscle, n. Muscular tissue of the heart that contracts rhythmically and continuously

Example: Without the cardiac muscle of the heart, our blood would not be able to be pumped throughout the body, and the body would not be able to function.

Variation(s): cardiac muscles

contract, v. To bring together; to shorten; to tighten

Example: An earthworm must contract its body to move itself from one place to another.

Variation(s): contracts, contracted, contracting

involuntary muscle, n. Muscle that cannot be controlled by choice

Example: An example of an involuntary muscle is the cardiac muscle of the heart, because we do not need to think about making it contract in order for it to do its job.

Variation(s): involuntary muscles

muscles, n. Body tissue made of long cells that can contract, or tighten, and relax to produce motion

Example: Exercise is very important to keep muscles healthy.

Variation(s): muscle

nerves, n. Bundles of fibers throughout the body that transmit sensations, information, and instructions to the brain and spinal cord

Example: The nerves in my fingertips sent information to my brain to know that the water was hot.

Variation(s): nerve

voluntary muscles, n. Muscles that can be controlled by someone's own choice


Example: Mejida contracted the voluntary muscles in her arm to bend her elbow.

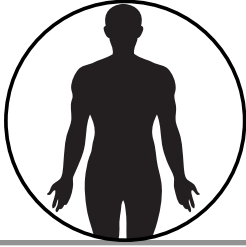
Variation(s): voluntary muscle

vulnerable, adj. Able to be hurt or injured

Example: If athletes did not wear helmets when they played contact sports, their heads would be vulnerable to serious injury.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	Image Cards 5 and 7	10
	What Do We Know?		
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	The Muscular System		20
<i>Discussing the Read-Aloud</i>	Comprehension Questions		15
	Word Work: Voluntary Muscles and Involuntary Muscles		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	KWL Chart	Instructional Master 1B-1 (optional)	20
	Simon Says		



The Muscular System

4_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Remind students that the various human body systems are interconnected. Show Image Card 5 (Axial Bones) and Image Card 7 (Appendicular Bones). Ask for a volunteer to identify each different set of bones, and then ask students to share what they remember about these two types of bones. Ask students which system the bones are in (skeletal), and what they recall about the different types of joints (movable, immovable, and partially movable). Then ask them to explain why cartilage and ligaments are important to the skeletal system. Review that cells are the building blocks of life. Encourage students to explain that the different types of cells make up the tissues that make up the different organs in the human body.

What Do We Know?

Tell students that today they will be learning about the different types of muscles in the human body. Ask students to identify any muscles they know in their body and to share the different ways they use their muscles. Ask students, “Are all your muscles’ actions able to be seen?” Revisit the ‘K’ and ‘W’ sections of the KWL chart and add what students know about their muscles. Write any questions students have about their muscles in the ‘W’ section of the chart. Encourage students to listen carefully to the information in the read-aloud to correct any misunderstandings and/or to add more information to the KWL chart.

Purpose for Listening

Tell students to listen carefully to learn about their muscular system, how it is interconnected with other body systems, and the different types of muscles in the human body.



The Muscular System

← Show image 4A-1: Ricardo

1 [Pause for students to answer.]

Hi, guys. It's me—Ricardo. Last time we were together, I told you that our next discussion would be about a system that works extremely well with your skeletal system. Did any of you predict the name of the system we're going to talk about today? ¹ If you predicted the muscular system, you're correct! You've learned how the bones in your skeletal system are connected from head to toe. Bones form the important framework of your body, but they could not move without the help of your **muscles**.



← Show image 4A-2: Muscles and muscle fibers²

2 What do you see in this image?

3 The word *musculus* means little mouse. It is thought that a long time ago somebody observed muscle movement under the skin and thought it looked like a little mouse moving underneath, and that is how muscles got their name!

4 [Point to the muscle fibers in the image.]

What are muscles? The word *muscle* comes from the Latin word *musculus*. ³ Muscles are made up of bundles of long, thin cells. ⁴ They are controlled by signals that come from your brain and spinal cord, which carry messages through **nerves** to every part of your body. Muscles receive these messages, telling them *when* to **contract**, or tighten, *how* to contract, and for how long. When muscles contract, they squeeze together, shortening and causing movement. Muscles are at work in your body all the time, even while you are sleeping. You have more than 650 muscles in your body, making up between one-third and one-half of your body weight.

5 [Have a student volunteer point to these axial muscles on his/her body.]

There are three types of muscles in your body, but most of them are skeletal muscles. Your skeletal muscles work closely with your bones to give them mobility, or motion. Just as there are axial bones and appendicular bones, there are axial muscles and appendicular muscles. Which muscles do you think are axial? Right—the ones in your head, neck, and torso. ⁵ And where are the appendicular muscles located? Yes! In your arms and legs.



← Show image 4A-3: Arm muscles

Most muscles work in pairs. Muscles only pull on bone; they cannot push. As your muscles pull on bone, they contract, or get shorter. In order to relax, or lengthen, muscles need a partner to pull the bone in the opposite direction. Paired muscles never pull at the same time. One pulls, the other relaxes. One relaxes, the other pulls.

Look at this picture of the muscles in your upper arm. It shows what happens when you make a fist and bend your arm.⁶ The bicep muscle contracts and bends your elbow while your tricep muscle relaxes. When you straighten your arm out again, your tricep muscle contracts and your bicep muscle relaxes.⁷ By working in pairs, taking turns pulling on your bones, skeletal muscles enable you to ride a bike, play the guitar, or climb a mountain.

Skeletal muscles come in all sorts of shapes and sizes—fat and skinny, long and circular. Because you control your skeletal muscles, deciding when and how you want to move your bones, they are called **voluntary muscles**. The movement does not happen automatically. You make a conscious decision to move the muscles attached to your bones.

6 [As you read the following sentences, point to the biceps and the triceps in the image.]

7 Do this action with me and see if you can feel your muscles contracting.



← Show image 4A-4: Leg muscles and Achilles tendon

Narrow, rope-like tissues, called tendons, attach bones to muscles. You can see the tendons under your skin if you flex your arm back and forth. Try it. Bend your elbow as if you wanted to show off your muscles, and feel the tendon just under the skin on the inside of your elbow. What are other good places to view your tendons in action? Try looking at your neighbor's neck. Can you find the tendons as he turns his head? Can you find tendons in your arms or legs?⁸

The muscles in your legs are the largest and strongest skeletal muscles in your body. One of these muscles is your calf muscle. See if you can feel your calf muscle at the back of your lower leg.⁹ Your calf muscle is responsible for much of your movement, helping to bend your knee when you walk or run. It is attached to your heel bone by the longest and most powerful tendon in your body, the Achilles tendon.

8 [Pause to allow students to locate tendons.]

9 [Pause to show students where the calf muscle is located.]

If your Achilles tendon is cut or torn, the use of the leg for jumping and running is lost immediately until it heals. An ancient Greek legend has long been told about the Achilles tendon as a figurative phrase to indicate our weak spots, places where we feel most likely to be hurt, either physically or emotionally.



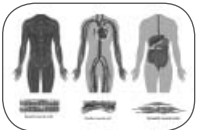
← **Show image 4A-5: Myth of Achilles**¹⁰

10 Who can tell me what a myth is?

11 The River Styx is not a real river on Earth. It is a mythical river believed by the ancient Greeks to be located between Earth and the Underworld.

The myth goes something like this: Long ago, in ancient Greece, a baby was born. According to custom, his mother held him by the heel and dipped his body into the River Styx.¹¹ It was thought that the waters of this powerful river could make a person invincible, unable to be defeated in battle. Achilles grew up to be a warrior, and indeed the river’s power seemed to protect him from injury throughout many battles. However, there was one spot on his body that the waters had not touched. That was the spot where his mother had held him, Achilles’ heel. He was finally killed when an arrow pierced his heel, his one **vulnerable** spot. From then on, people have referred to their own area of weaknesses as their “Achilles’ heel.”

Poor Achilles. It’s a shame he wasn’t wearing some armored footwear. Oh, well. It’s only a myth. Let’s move on and learn about the other types of muscles in your body.



← **Show image 4A-6: Types of muscles and muscle cells**

In addition to skeletal muscle, there is smooth muscle and **cardiac muscle**. Are you ready for another riddle?

*I am a muscle. Like music, I have a rhythm and a beat. I am protected by the rib cage. What am I?*¹²

12 [Pause for students to answer.]
(heart)

Does anyone know what type of muscle is contained in your heart—smooth or cardiac? Your thick, powerful heart is made of cardiac muscle, the strongest muscle in your body, found only in your heart. Unlike skeletal muscle, healthy cardiac muscle never tires. It is continually contracting and relaxing, rhythmically pumping blood around your body all day and all night. Cardiac muscle is an **involuntary muscle**, meaning that you do not control its movement. Your brain controls how fast your heart beats without you even thinking about it. Why do you think that is important?¹³

13 [Pause for students to answer.]

14 So, the muscular system and the digestive system are interconnected.



15 [Give students a chance to make predictions about the system. Be sure to have them look at Ricardo's shirt in the image for clues.]

Smooth muscle is the third type of muscle in your body. It is also involuntary muscle because you cannot consciously move smooth muscle. It contracts exactly like skeletal muscles do, only much more slowly. Lining the walls of internal organs and blood vessels, smooth muscle uses less energy than skeletal muscles. It squeezes and tightens, mixing and churning food in the stomach. It lines your lungs and blood vessels, too.¹⁴

← **Show image 4A-7: Ricardo**

The next time we meet, we'll talk about the system that controls all of your other body systems. This system controls both the voluntary and involuntary muscles in your body, and much more. Can you guess what system you will learn about next time? I'll see you next time, and we'll see if you've guessed correctly!¹⁵


Discussing the Read-Aloud



20 minutes

Comprehension Questions

15 minutes



If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** You may wish to have students collect their written responses in a notebook or folder to reference throughout the domain as source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1.  *Inferential* What are muscles made of? (bundles of long, thin cells) Why is the muscular system important to the human body? (It helps the body move and do other things that we can't see, like the stomach and intestines digesting food and the heart pumping blood. It is the framework of the human body, together with the skeletal system.)

2. *Inferential* When muscles contract, what do they do? (They squeeze together, shortening and causing movement.) In the read-aloud you heard that muscles work in pairs. What does that mean? (Because muscles only pull on bone, one muscle needs another muscle to pull a bone in the opposite direction when it wants to move. One muscle pulls while the other relaxes. The paired muscle relaxes while the other pulls.)
3. *Literal* What attaches bones to muscles? (tendons) What is the longest and most powerful tendon in the body? (the Achilles tendon) What happens if damage is done to the Achilles tendon? (The ability to use the leg for running and jumping is lost immediately until the tendon can heal.)
4. *Inferential* According to the Greek myth, why was Achilles' heel vulnerable? (It was vulnerable because it was the one part of his body the water did not touch when his mother dipped him into the River Styx.)
5.  *Evaluative* Compare and contrast voluntary and involuntary muscles. (They are both muscles in the human body. Voluntary muscles do not move automatically. You have to make a decision to move a voluntary muscle. Involuntary muscles move automatically without needing to think about moving them.)
6. *Inferential* Name examples of voluntary and involuntary muscles. (Answers may vary, but may include some of the following: voluntary—arm and leg muscles; involuntary—cardiac and smooth muscles.)
7. *Inferential* What are the different types of muscles in the body? (skeletal muscle, cardiac muscle, smooth muscle, voluntary muscle, involuntary muscle) What is the most common muscle in the body? (skeletal muscle) Where is cardiac muscle located? (in the heart) Where is smooth muscle located? (in the walls of internal organs such as the intestines and lungs, and in blood vessels)
8.  *Inferential* What other systems are interconnected with the muscular system? (the skeletal system, the nervous system, and the digestive system) How do the skeletal muscles work closely with the skeleton to help us move? (Skeletal muscles are attached to the bones in the skeleton, the body's framework. Skeletal muscles are voluntary, so when we make the decision to move, it is the skeletal muscles that help the skeleton move.)

9. *Evaluative* Compare and contrast tendons and ligaments. (Both tendons and ligaments are parts of the body made of stretchy tissue. Tendons attach muscle to bone, whereas ligaments hold bones together at the joints.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

10.  *Evaluative Think Pair Share:* Why do you think it's important that there are voluntary and involuntary muscles? (Answers may vary.)
11. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Voluntary Muscles and Involuntary Muscles 5 minutes

1. In the read-aloud you heard, "Because you control your skeletal muscles, deciding when and how you want to move your bones, they are called *voluntary muscles*." You also heard, "Cardiac muscle is an *involuntary muscle*, meaning that you do not control its movement."
2. Say the words *voluntary muscles* and *involuntary muscles* with me.
3. Voluntary muscles are those that can be controlled with someone's own choice; involuntary muscles are those that are not controlled by choice.
4. I use the voluntary muscles in my legs to jump high in the air, but my heart is an involuntary muscle because I don't do anything to make it contract—it does that on its own!
5. What are some examples of voluntary muscles? Can you think of examples of involuntary muscles? Be sure to use the words *voluntary muscles* and *involuntary muscles* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students' responses to make complete sentences: "_____ is an example of a voluntary muscle, and _____ is an example of an involuntary muscle."]
6. What are the words we've been talking about? What part of speech are the words *voluntary muscles* and *involuntary muscles*?

Use a *Word Parts* activity for follow-up. Write the words *voluntary* and *involuntary* on a piece of chart paper, a chalkboard, or a whiteboard. Ask students, “What is the difference between the words *voluntary* and *involuntary*? (the prefix *in-*) How does adding the prefix *in-* to *voluntary* change that word?” (It makes it mean the opposite of *voluntary*.)
Directions: I am going to say a word and ask you to tell me what that word means. If you do not know, I will help you. Then I would like you to add the prefix *in-* to the word and tell me what that new word means.

1. **visible** (able to be seen; *invisible* means not able to be seen)
2. **accurate** (correct, or free from mistakes; *inaccurate* means not correct)
3. **complete** (having all the necessary parts; *incomplete* means missing something)
4. **flexible** (able to move and bend easily; *inflexible* means not easily moved or bent)
5. **edible** (able to be eaten; *inedible* means not able to be eaten)



Complete Remainder of the Lesson Later in the Day



The Muscular System

4_B

Extensions

20 minutes

KWL Chart (Instructional Master 1B-1, optional)

Review any information related to the muscular system. Ask students if there is any information in the 'K' column that should be revised based on what they learned in the read-aloud. Reread small sections of the text aloud and/or revisit any image supports as necessary to help students check the accuracy of their responses. Then cross out the inaccurate information in the 'K' column. Make necessary revisions. Then ask students if they discovered the answers to any of their questions. If so, record relevant answers in the 'L' column. Ask what else they learned from the read-aloud, recording these responses under the 'L' column as well.

You may have students work in groups or with a partner to record (drawing and/or writing) information learned about each human body system.

- You may wish to have some students fill in the instructional master independently. You may also choose to allow students to complete research to answer some of the 'W' questions.

Simon Says

Review the types of muscles and bones that are part of the skeletal and muscular systems discussed in the read-aloud text. As a class, play Simon Says, having students focus on the examples discussed. Be sure to reinforce domain-related vocabulary throughout this exercise. Examples may include some of the following:

- Simon says, "Find a place on your body containing cartilage."
- Simon says, "Point to a voluntary muscle on your body."
- Simon says, "Point to your skull."
- Simon says, "Point to your rib cage."
- Simon says, "Point to a ball-and-socket joint."
- Simon says, "Point to the Achilles tendon."



The Nervous System

5

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✓ Explain that one of the systems of the human body is the nervous system and identify its function
- ✓ Identify the brain and spinal cord as the control center of the body
- ✓ Identify nerves as messengers that transmit information from all of the parts of the body through the spinal cord to the brain
- ✓ Explain how the skeletal, muscular, and nervous systems are interconnected
- ✓ Explain that the five senses work with the brain to process information about our surroundings
- ✓ Describe a reflex action as a quick, unconscious action and explain its purpose in protecting the human body

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe the relationship between the parts of the nervous system in “The Nervous System” using language that pertains to sequence and cause/effect (RI.3.3)
- ✓ Interpret information from a KWL chart created in *The Human Body: Systems and Senses* (RI.3.7)
- ✓ Make personal connections to concepts presented in *The Human Body: Systems and Senses* through engagement with a class KWL chart (W.3.8)

- ✓ Categorize and organize statements and questions about the human body through engagement with the KWL chart used in *The Human Body: Systems and Senses* (W.3.8)
- ✓ Follow up on earlier predictions prior to hearing “The Nervous System” about which human body system is controlled by the brain based on an image, and then compare the actual outcomes to predictions (SL.3.1a)
- ✓ Make predictions after hearing “The Nervous System,” prior to conducting an experiment about the body’s reflexes based on the title, images, and/or text heard thus far, and then compare the actual outcomes to predictions (SL.3.1a)
- ✓ Summarize the goal of an experiment presented orally after hearing “The Nervous System” (SL.3.4)
- ✓ Determine the meaning of the new word formed when a known affix is added to a known word such as *un-* and *expected* (L.3.4b)
- ✓ Distinguish the literal and nonliteral meanings of phrases, such as “control center” as used in “The Nervous System” (L.3.5a) (RI.3.4)
- ✓ Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships, such as “sending signals” (L.3.6)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

command, *n.* Control; power

Example: There are certain parts of the body that we have command over, like the voluntary muscles.

Variation(s): commands

consciously, *adv.* Done on purpose; deliberately

Example: Sophia consciously avoided the large puddles as she walked in the rain so her shoes would not get soaked.

Variation(s): none

coordinates, v. To make different things work together effectively as a whole

Example: The brain coordinates the many different human body systems to work efficiently.

Variation(s): coordinate, coordinated, coordinating

fibers, n. Thin, threadlike cells

Example: There are two different kinds of fibers in muscle tissue.

Variation(s): fiber

receptors, n. Organs or nerve endings that receive information from inside and outside the body and send that information to the brain

Example: The receptors in your fingers keep you from holding onto a hot item for too long and burning your skin.

Variation(s): receptor

reflex, n. An action that happens almost instantly, often without the brain sending a message to perform the action


Example: Blinking when something quickly gets too close to your face is a reflex, something that happens instantly and involuntarily.

Variation(s): reflexes

unconsciously, adv. Done without being aware

Example: Because Thomas was not paying attention to what he was doing, he unconsciously put salt in his coffee instead of sugar.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?		10
	What Do We Know?	KWL Chart	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	The Nervous System		20
<i>Discussing the Read-Aloud</i>	Comprehension Questions	index cards	15
	Word Work: Consciously and Unconsciously		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	KWL Chart	Instructional Master 1B-1 (optional)	20
	Think Fast: Reaction Time	Instructional Master 5B-1; plastic wrap; cotton balls	



The Nervous System

5_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Remind students that the various human body systems are interconnected. Ask students to share how the skeletal system and the muscular system are interconnected. Ask students to name the other systems they heard about that are interconnected with the muscular system. (the nervous system and the digestive system) Ask students to share what they remember about the different types of muscles (skeletal muscle, cardiac muscle, and smooth muscle) and where they are located in the human body. Ask students, “What is the difference between voluntary and involuntary muscles? Can you name examples of each?” Review that cells are the building blocks of life. Encourage students to explain that the different types of cells make up the tissues that make up the different organs in the human body.



What Do We Know?

← Show image 5A-1: Ricardo

Remind students that the system they are going to learn about today is the system that controls all the other body systems. Ask students to look at Ricardo’s T-shirt again, and then have a few volunteers share their predictions. After students have shared, be sure to point out that it is indeed a brain on Ricardo’s t-shirt if this observation has not been made. Tell students that they will be learning about the *nervous system* in the next two read-alouds, and they will hear about how the *nervous system* is closely interconnected with the other systems in the human body. Tell students that the word *nervous* in this context has nothing to do with feeling anxious, worried, or scared about something.

Ask students to share what they know about the nervous system. Ask students, “What does the nervous system control? Can you see the nervous system working? What important organs are related to the

nervous system?” Revisit the ‘K’ and ‘W’ sections of the KWL chart and add what students know about the nervous system. Write any questions students have about their nervous system in the ‘W’ section of the chart. Encourage students to listen carefully to the information in the read-aloud to correct any misunderstandings and/or to add more information to the KWL chart.

Purpose for Listening

Tell students to listen carefully to learn about the nervous system and how it commands the interconnected human body systems. Also tell them to listen to learn why the brain on Ricardo’s t-shirt is the symbol for the nervous system. Tell students to listen for any new and interesting facts about the nervous system to add to the KWL chart.



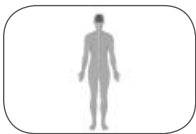
The Nervous System

← Show image 5A-1: Ricardo

Stand up and stretch with me a moment before we begin. Put your hands on your hip bones and bend forward as far as you can. Now, straighten back up slowly, one vertebra at a time. Ah, that's better. Now, I'm ready to get started. Are you? As you sit back down again, think about the body systems you used to move just now.

Did you use your skeletal system? You bet! How about your muscular system? Absolutely! Your muscles helped move your bones when you stood up and bent down. But, how did your muscles move? What told them what to do? Your brain! And your brain is part of a very important system. Does anyone know what that system is called? ¹ Yes—the nervous system!

1 [Pause for students to answer.]



← Show image 5A-2: Nervous system

The nervous system is your body's **command** system, the one that sends orders to all parts of your body. It is your communication system, carrying messages that control all other systems. The central nervous system includes the brain and the spinal cord. Without these central controllers, none of your body's other functions would happen. ²

Your brain is a soft mass of tissues protected by your skull, a rigid helmet-like structure of bones encasing the brain. The spinal cord, the main nerve pathway between your brain and the rest of your body, looks like a long, thick rope. It extends from the base of your skull, or brain stem, to your tailbone. Stretching down the back, this ropelike cord weaves its way through openings in your back's bony vertebrae. Your spinal cord is protected by your spinal column, this flexible column of vertebrae. ³

2 [Point to the brain and the spinal cord in the image as you read the following sentences.]

3 So, the skeletal and nervous systems are closely interconnected. Why do you think it's important that the vertebrae of the backbone protect the spinal cord?



← Show image 5A-3: Nerve network

A network of nerves links your brain and spinal cord to muscles and sense organs all over your body. Each nerve is a bundle of **fibers**, tiny threadlike cells encased in thin, fatty tissue. These bundles of specialized cells carry messages to and from the brain. These messages travel faster than the blink of an eye!

Some nerve cells collect messages from your brain and carry them to your muscles. This is what happened when you stood and bent over a few minutes ago. You **consciously** controlled your own actions with your brain. First, you made the conscious decision to stand, and your brain received that decision. Then, electrical signals were sent out from your brain, along nerve fibers, to your muscles, telling them to tighten, or contract. For every movement that you make, your brain **coordinates** the timing of muscle contractions, telling your muscles when to tighten, how much to tighten, and for how long. Your nervous system works with your bones and muscles to follow your brain's commands.⁴

4 So, the nervous system is closely interconnected with the skeletal and muscular systems.



← Show image 5A-4: Five senses

Some nerve cells collect messages from parts of your body and from your environment and the world around you. These nerve cells are called **receptors**. Receptors collect messages through your eyes, ears, nose, tongue, and skin. Each of your five senses works with your brain to help you understand the world around you. Eyes pick up light and color and send pictures to the brain to help you see. Ears pick up vibrations from sound waves, carrying them to the brain to help you hear. Sensory cells in the nose react to chemicals in the air, sending messages to the brain to help you smell. Cells on the tongue react to chemicals in food, sending signals to the brain to help you taste. Receptors in your skin detect many different sensations, alerting your brain and spinal cord to feelings of pain, heat, cold, pressure, and touch.

Many times, nerve signals pass through both your brain and spinal cord, but not always. Have you ever touched a hot iron or a hot pot on the stove? What happened? Most likely, you jerked your

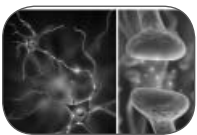
hand away from the heat very quickly, almost **unconsciously**. The nerves in your fingers sent signals to your spinal cord, but this time you did not need your brain at all. Your spinal cord sent a message to your arm muscles, telling them to contract and pull back. This super quick reaction to an emergency situation is called a **reflex** action because the body acts automatically, without thinking. Some of you may remember being at the doctor's office for a check-up when the doctor or nurse tapped your knee gently with a hard rubber tool called a plexor.⁵ Other common reflex actions are flinching and sneezing.

5 Who can tell me what your leg does when the rubber taps it? (It jerks upward.)

Because a nerve is made up of many cells, nerves can send many messages at once. Each nerve cell sends its own message through the nerve. You've learned that some nerve cells collect messages from the brain whereas others collect messages from the environment. Still other nerve cells collect messages from inside your body.

Inside the human body, the brain and spinal cord work together day and night, coordinating many activities that we don't really think about too often. For example, your breathing is controlled by the central nervous system. What else is going on under your skin that seems involuntary, or automatic?⁶ Digestion, heart rate, and sleep patterns are all automatically controlled by the brain and spinal cord. Your emotions, moods, and memories are controlled and managed by the nervous system, too. The body's command center, with its network of nerves, is always working, even while you sleep.

6 [Pause for students to answer.]



← **Show image 5A-5: Nerve cells**

Hundreds of billions of microscopic cells are sending messages that go dashing about your body at amazing speeds every second. Many of these cells are bundled up inside nerves, the body's wiring. These nerves branch out in all directions, carrying tiny electrical-chemical signals from your brain and spinal cord to the tips of your fingers and toes, to the inside of your eyes and ears, and to every other part of your body. Some nerves are much thinner than a strand of hair. Others are as thick as a bungee cord. All have an important part to play in the nervous system's nonstop communication process.

The nervous system processes almost everything you do. It helps you laugh and scratch your chin. It helps you run and walk and swim. It lets you scream with anger and shout for joy. It lets you smell tomato soup simmering on the stove, hear squirrels rustling in the leaves, and see a brilliant sunrise peeping over the hill. Thank your nervous system for that tingling feeling that you get when you jump into a cold stream, or the instant pain that you feel when you prick your finger on a rose's thorn. Whether you are two or ninety-two, your nerves are a central part of everything you do.

Next time, we'll look more closely at your body's main control center, the brain. Let's pause for a riddle before I go:

7 [Pause for students to answer.]

*I am called a bone, but I am really a nerve. My name suggests that I have a sense of humor. What am I?*⁷



← **Show image 5A-6: Ricardo bumping his funny bone**

Give up? I'm the "funny bone"! Does anyone know where the funny bone is located? It is a vulnerable nerve at the end of the elbow bone.⁸ If you hit that nerve at the end of your elbow, the nerve sends a tingly feeling up the rest of your arm. If you injure your funny bone, the result is anything but funny. It can be very painful, causing numbness in your forearm and hand. So as it turns out, the funny bone is not only *not* funny, but it's not a bone at all! Be careful the next time you're wrestling with your friends. You won't be laughing if you hit your funny bone!⁹

8 [Have students locate their funny bone.]

9 Have you ever hit your funny bone? Did you think it was funny?



← **Show image 5A-7: Ricardo**




Well, I'll be back next time to tell you more about your body's command center. Can you guess what I mean when I say command center?¹⁰ See you later!




10 [Point to the hint on Ricardo's T-shirt.]

Comprehension Questions

15 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding the students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses. **It is highly recommended that students answer at least one question in writing and that some students share their writing as time allows.** You may wish to have students collect their written responses in a notebook or folder to reference throughout the domain as source material for longer writing pieces and as preparation for written responses in the Domain Assessment.

1.  *Inferential* What is one phrase you could use to describe the nervous system? (the “command center”) What does the central nervous system control? (The central nervous system controls the functions of the body and all of the other systems.) What makes up the nervous system? (the brain, the spinal cord, nerves)
2.  *Inferential* What is the part of the axial skeleton that encases the brain? (the skull) Why is it important for the brain to be protected by the bones in the skull? (The brain is vulnerable, and damage to the brain is very serious and can affect the functions of all of the systems of the human body.)
3. *Inferential* What is the purpose of the network of nerves in the nervous system? (The nerves link the brain and the spinal cord to muscles and other organs all over the body, sending signals throughout the body.) What is a nerve? (a bundle of fibers encased in tissue)
4.  *Evaluative* At the beginning of the read-aloud, you stood up and stretched. Describe what happened between your brain, your muscles, and your bones. (Once the conscious, voluntary decision to stand up was made, electrical signals were sent from the brain down the spinal cord, along the nerves, to the muscles involved in standing. These signals coordinated the timing of the muscles to contract and told them how long to contract, helping the bones to move.)

5. *Evaluative* Could your brain be the command center of your body if you had no receptors? Explain why or why not. (No. Receptors are nerve cells that collect messages from inside the body and through the five senses and send these messages to the brain. The brain is then able to help the body process how to react and understand the world around you.)
 6. *Inferential* What is a reflex action? (an automatic/unconscious/involuntary action) What causes a reflex action to happen? (Nerves from one part of the body send signals to the spinal cord, which sends messages back to the muscles, sometimes not involving the brain at all.)
 7.  *Inferential* Name some situations where reflex actions take place. (Answers may vary, but may include the following: touching something hot and the hand moving away quickly; having a ball thrown at your face and flinching or closing your eyes; pulling a hand away from touching something sharp or prickly; sneezing after sniffing pepper; having your knee jerk upward when tapped; etc.)
 8. *Evaluative* Why are reflex actions important in emergency situations? (Answers may vary.)
 9.  *Evaluative* **What? Pair Share:** Asking questions after a read-aloud is one way to see how much everyone has learned. Think of a question you can ask your neighbor about the read-aloud that starts with the word *what*. For example, you could ask, “What do nerves do in the nervous system?” Turn to your neighbor and ask your “what” question. Your neighbor will write your question on an index card and then read it back to you. Be sure to suggest corrections to clarify your meaning if your question doesn’t sound the way you intended. Next, your neighbor will respond to your question. Listen to your neighbor’s response. Now switch places and have your neighbor ask a new “what” question, which you will write down, read back, and respond to. I will call on several of you to share your questions and answers with the class. (Answers may vary.)
 10. After hearing today’s read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Consciously and Unconsciously

5 minutes

1. In the read-aloud you heard, “You made voluntary decisions, *consciously* controlling your own actions with your brain.” You also heard, “Most likely, you jerked your hand away from the heat very quickly, almost *unconsciously*.”
2. Say the words *consciously* and *unconsciously* with me.
3. *Consciously*, similar to *voluntarily*, means done on purpose or deliberately; *unconsciously*, similar to *involuntarily*, means done without awareness or control.
4. I was so consciously focused on listening carefully to the teacher, that I unconsciously dropped my pencil.
5. What kinds of things have you done consciously or unconsciously? What were they? Be sure to use the words *consciously* and *unconsciously* when you tell about them. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I consciously . . .” and “I unconsciously . . .”]
6. What are the words we’ve been talking about? What part of speech are the words *consciously* and *unconsciously*?

Use a *Word Parts* activity for follow-up. Write the words *consciously* and *unconsciously* on a piece of chart paper, a chalkboard, or a whiteboard. Ask a student volunteer to circle the prefix *un-* and define its meaning. Ask students, “How does adding the prefix *un-* to *consciously* change that word?” (It makes it mean the opposite of *consciously*.) Directions: I am going to say a word and ask you to tell me what that word means. If you do not know, I will help you. Then I would like you to add the prefix *un-* to the word and tell me what that new word means.

1. **expected** (something that you think or know is going to happen; *unexpected* means something that happened without notice or warning)
2. **healthy** (free from illness; *unhealthy* means ill)
3. **fortunately** (luckily; *unfortunately* means unluckily)
4. **popular** (liked by many people; *unpopular* means not generally well-liked)
5. **kindly** (helpfully, considerately; *unkindly* means harshly or cruelly)



Complete Remainder of the Lesson Later in the Day



The Nervous System

5_B

Extensions

20 minutes

KWL Chart (Instructional Master 1B-1, optional)

Review any information related to the nervous system. Ask if there is any information in the ‘K’ column that should be revised based on what students learned in the read-aloud. Reread small sections of the text aloud and/or revisit any image supports as necessary to help students check the accuracy of their responses. Then cross out the inaccurate information in the ‘K’ column. Make necessary revisions. Then ask if students discovered the answers to any of their questions. If so, record relevant answers in the ‘L’ column. Ask what else students learned from the read-aloud, recording these responses under the ‘L’ column as well.

You may have students work in groups or with a partner to record (drawing and/or writing) information learned about each human body system.

- You may wish to have some students fill in the instructional master independently. You may also choose to allow students to complete research to answer some of the ‘W’ questions.

Think Fast: Reaction Time (Instructional Master 5B-1)

Tell students that today they are going to complete a simple experiment as a class. Tell students that today’s experiment involves plastic wrap and cotton balls, and that they are going to test the body’s reflexes. Ask students, “How do you think your body will react to having something thrown at your face, even with a clear barrier in front of it?” Explain that before scientists begin an experiment, they make predictions about what they think will happen. Give students Instructional Master 5B-1, and have them write down their predictions.

Have students form two to three groups, giving one student volunteer from each group a sheet of plastic wrap and another volunteer a cotton ball. Have the first volunteer hold the sheet of plastic wrap about one foot away in front of his/her face. Have the other student throw the cotton ball at the partner’s face. Make sure students take note of their blinking

reaction. Have the second group move the barrier farther away, and have the third group move the barrier a little closer to the face.

Ask students, “Does the reaction shift as the barrier moves farther or closer away?” Discuss how the blinking reflex serves to protect the eyes from damage. Discuss other bodily reactions controlled by the nervous system that serve to protect the body from harm. Have students write two to three sentences about this experiment on their instructional master.

Note: You may wish to have students complete this instructional master with a partner or in groups.



Pausing Point 1

PP₁

Note to Teacher

This is the halfway mark of the *The Human Body: Systems and Senses* domain. Students have been introduced to seven of the human body's systems, and have studied in further depth the skeletal system, the muscular system, and the nervous system. It is highly recommended that you pause here and spend two days reviewing, reinforcing, or extending the material taught thus far.

You may have students do any combination of the activities listed below. The activities may be done in any order. You may wish to do one activity on successive days. You may also choose to do an activity with the whole class or with a small group of students who would benefit from the particular activity.

Core Content Up to This Pausing Point

Students will:

- ✓ Briefly describe and/or review seven of the systems of the human body
- ✓ Explain that the human body includes the following systems and identify the function of each: skeletal, muscular, and nervous
- ✓ Identify cells as the basic building blocks of all living things and explain that most cells are too small to be seen without a microscope
- ✓ Explain the relationship between cells, tissues, organs, and systems
- ✓ Explain that each system is made up of different types of cells (bone cells, muscle cells, nerve cells, blood cells, etc.)
- ✓ Explain that one of the systems of the human body is the skeletal system and that it has two parts
- ✓ Recall that there are 206 bones in the human body
- ✓ Explain briefly the composition of bones
- ✓ Identify examples of axial bones and explain their functions
- ✓ Identify examples of appendicular bones and explain their functions

- ✓ Identify three different types of joints and give examples of each: movable, immovable, and partially movable
- ✓ Describe how doctors are able to see and treat the skeletal system using an x-ray
- ✓ Explain the importance and purpose of cartilage
- ✓ Identify skeletal, smooth, and cardiac as three types of muscles in the human body and describe their functions
- ✓ Compare and contrast involuntary and voluntary muscles
- ✓ Explain that skeletal muscles work closely with bones to give the human body mobility
- ✓ Demonstrate familiarity with the legend of the Achilles heel/tendon
- ✓ Identify the brain and spinal cord as the control center of the body
- ✓ Identify nerves as messengers that transmit information from all parts of the body through the spinal cord to the brain
- ✓ Explain how the skeletal, muscular, and nervous systems are interconnected
- ✓ Explain that the five senses work with the brain to process information about our surroundings
- ✓ Describe a reflex action as a quick, unconscious action and explain its purpose in protecting the human body

Activities

10 Human Body System Review

Materials: Poster 1

Use Poster 1 (Human Body Systems) to review the seven body systems that are reviewed in the first read-aloud. Ask students to identify each system and discuss its purpose. Encourage students to use domain-related vocabulary.

KWL Chart

Materials: Instructional Master 1B-1; trade books

Review with students the KWL chart you have filled out thus far, encouraging students to use domain-related vocabulary. For the 'W'

section, you may choose to allow students to conduct research to answer some of the questions they have about the human body that have not been answered. Refer to the list of recommended resources provided in the Introduction.

Letters to Dr. Welbody and Ricardo

Tell students to look at the ‘W’ section and pick out one or two items they find the most interesting. Then have students write letters to Dr. Welbody and/or Ricardo, asking her/him for information or advice on their chosen items from the ‘W’ section. Students may also share with Dr. Welbody or Ricardo a fact or two they think is interesting about the human body.

Note: You may wish to review with students the parts of a letter before they begin to write to Dr. Welbody. You may also choose to act as Dr. Welbody and/or Ricardo and answer students’ letters.

Image Review

Show the images from any read-aloud again, and have students retell the read-aloud using the images.

Image Card Review

Materials: Image Cards 1–14

In your hand, hold Image Cards 1–14 fanned out like a deck of cards. Ask a student to choose a card but to not show it to anyone else in the class. The student must then give a clue about the picture s/he is holding. For example, for axial bones, a student may say, “I make up the trunk or the core of the human body.” The rest of the class will guess what is being described. Proceed to another card when the correct answer has been given.



Domain-Related Trade Book or Student Choice; Summarizing the Main Idea

Materials: Trade book; chart paper, chalkboard, or whiteboard

Read an additional trade book to review the skeletal, muscular, and nervous systems; refer to the books listed in the domain introduction. You may also choose to have students select a read-aloud to be heard again.

You may wish to have students take notes and create an outline to summarize the main idea of a particular topic in the trade book or read-aloud. Be sure to guide students in this important method of gathering information.

You may wish to model how to actively listen and take notes by doing the following activity with students:

- In preparation for this activity, pick out two or three core vocabulary words from the read-aloud you plan to reread, and write them on chart paper, a chalkboard, or a whiteboard.
- Begin by asking a few volunteers to share what they would say the main idea is regarding the read-aloud you are about to re-read. This discussion is meant as a review and warm-up for active listening. Point out the core vocabulary words you have chosen and have students read them together chorally. Tell students that as you are rereading, they should be carefully listening, especially when you get to one of the words on the board.
- Tell students that as you read, they will be jotting down notes—words or short phrases that best express the main idea. Be sure to tell them that they should not be writing in complete sentences. You may wish to model and have students follow an outline style. As you read, you may want to slow down or even pause after reading the Guided Listening Supports that follow the core vocabulary words you have chosen.
- When you are finished rereading the read-aloud, have a few volunteers share one or two notes they have taken. Be sure to give feedback to help shape effective notes, and allow students to record any modifications you guide them through.
- Now have students summarize in two or three sentences the main idea for this read-aloud using the three core vocabulary words in their sentences.

Simon Says

As a class, play Simon Says to reinforce domain vocabulary learned thus far for the different parts of the skeletal and muscular systems. You may wish to conduct a review prior to playing the game to refresh students' memories and to enhance participation.

Song: "Dry Bones"

Find a recording of the song "Dry Bones." Have students listen to the song once or twice, and encourage them to point to the various body parts mentioned in the song. After listening to the song, have students discuss the more technical names for the bones they learned about in the read-alouds, i.e., the "head bone" as the skull or cranium; the "back

bone” and “neck bone” as the spine or spinal column; the “thigh bone” as the femur; the “knee bone” as a hinge joint; etc.

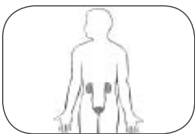
Ask students, “The skull and spine are both called what types of bones?” (axial bones) Ask, “What is another name for the bones in the legs and arms that “hang onto” the axial skeleton?” (appendicular bones) Reinforce how the different body parts mentioned in the song are interconnected. Explain that the bones inside our bodies are not actually dry. Ask students why they think that is.

Note: If your school has a music teacher, you may want to collaborate with him/her to teach this song to your students.

Key Vocabulary Brainstorming

Materials: Chart paper, chalkboard, or whiteboard

Give students a key domain concept or vocabulary word such as *cells*. Have them brainstorm everything that comes to mind when they hear the word, such as *building blocks for living things, microscopic, billions*, etc. Record their responses on a piece of chart paper, a chalkboard, or a whiteboard for reference.



➤ Multiple Meaning Word Activity: Organ

◀ Show image 1A-7: The excretory system

Complete a *Sentence in Context* activity with the word *organ*.

1. In Lesson 1, you heard, “Your skin, the largest organ of the body, excretes sweat through its many pores.” This organ is a part of the body that performs a specific function.
2. Even though skin has a specific function just as each of the other organs in your body do, who can tell me what the main difference is? (Most of your organs are on the inside of your body, but skin is on the outside.) [Have a student point to the organs in the image—the skin, kidneys, and bladder.]
3. The word *organ* can have another meaning. An organ is also a keyboard instrument with many pipes; it makes music when someone plays the keyboard and uses foot pedals to pump air through the pipes. An organist is a person who plays the organ. An organ is played in very much the same way that a piano is played. The organist presses the keys on the keyboard with his or her fingers, while at the same time pressing the pedals with his or her feet.

4. Organs in your body and organs that play music are both nouns, because they are things. Which is living, and which is nonliving?
5. With your neighbor, make a sentence for one of the meanings of *organ* and another sentence using the word *organist*. Remember to be as descriptive as possible and use complete sentences. I will call on some of you to share your sentences. [Call on a few student pairs to share one or all of their sentences. Have them point to the image if their sentence is about organs in the body. You may also choose to have students draw an illustration to depict the word *organ*.]

10 Riddles for Core Content

Ask students riddles such as the following to review core content:

- I am the building block for all living things, and there over two hundred types of me in the human body. What am I? (a cell)
- I am a part of the body's systems and have clearly defined functions. Examples of me include the stomach, the liver, and the intestines. What am I? (an organ)
- I am a strong, elastic tissue. I can be found in places like the tip of your nose and the top of your ear. What am I? (cartilage)
- I am the system that helps to give your body structure, and I work to protect your organs. What am I? (the skeletal system)
- I am the area where two bones come together. What am I? (a joint)
- I am a very strong muscle. I contract rhythmically without you having to control the speed of the beat. What am I? (the heart)
- I am the system that includes nerves, the brain, and the spinal cord. What am I? (the nervous system)

Class Book: *The Human Body: Systems and Senses*

Materials: Drawing paper, drawing tools

Tell the class or a group of students that they are going to make a class book to help them remember what they have learned thus far in this domain. Have students brainstorm important information about the muscular, skeletal, and nervous systems. Have each student choose one idea to draw a picture of, and ask him or her to write a caption for the picture. Bind the pages to make a book to put in the class library for students to read again and again. You may choose to add more pages upon completion of the entire domain before binding the book.

Writing Prompts

Students may be given an additional writing prompt such as the following:

- The most interesting thing I've learned thus far is _____ because . . .
- The nervous/muscular/skeletal system is important for survival because . . .
- I would like to learn more about _____ because . . .
- ✍ I would compare and contrast the nervous, muscular, and skeletal systems by . . .
- ✍ Using as a model the myth and figurative expression you learned about Achilles and the Achilles tendon, write a myth that explains the funny bone.

Nerves at Work

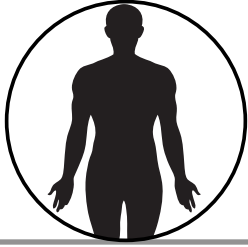
Materials: Rulers

Tell students that nerves are crucial for speedy reaction time. Ask students, "Can you think of situations where it is important to have a quick reaction?" Review with students that a reflex is involuntary and does not involve the brain; today they will be testing their voluntary reactions.

One student will hold the ruler vertically at its uppermost end between his/her thumb and index finger. The other student will put his/her thumb and index finger spread about two inches apart at the lowest end of the ruler. Without a signal, the student holding the ruler will let it go. The other student will try to catch the ruler between his/her thumb and index finger. The speed of the reaction can be relatively measured by looking at the number on the ruler where the student's thumb and index finger caught the falling ruler. If some students have a difficult time catching the ruler, tell the person holding it to give the other student a signal when the ruler will be dropped. Give students several turns dropping and trying to catch the ruler.

Guest Presenter

Invite the school nurse to come to the class and read a book or give a presentation on a topic related to the first five read-alouds in this domain. Parents or guardians who work in the health care profession (doctors, nurses, nurses' aides) would also be good sources.



The Nervous System and the Brain

6

✔ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Identify the brain and spinal cord as the control center of the body and the two essential organs of the nervous system
- ✓ Identify the parts of the brain and their functions: brain stem (medulla), cerebrum, and cerebellum
- ✓ Identify nerves as messengers that transmit information from all of the parts of the body through the spinal cord to the brain
- ✓ Describe the human brain as divided into two hemispheres and explain that each hemisphere controls the muscles of the opposite side of the body

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe the relationship between the nervous system and the brain in “The Nervous System and the Brain” using language that pertains to sequence and cause/effect (RI.3.3)
- ✓ Interpret information from a KWL chart created in *The Human Body: Systems and Senses* (RI.3.7)
- ✓ Describe images and how they contribute to what is conveyed about the parts of the brain in “The Nervous System and the Brain” (RI.3.7)
- ✓ Compare and contrast different organs which are protected by different parts of the skeletal system as presented in “The Nervous System and the Brain” and “The Skeletal System: Axial Bones” (RI.3.9)

- ✓ Use a Character/Setting/Plot graphic organizer to aid in planning a narrative writing piece that establishes a situation and introduces a narrator and/or characters, and organizes an event sequence that unfolds naturally (W.3.3a)
- ✓ Begin development of a narrative writing piece that uses dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations (W.3.3b)
- ✓ Use temporal words and phrases to signal event order in a narrative piece (W.3.3c)
- ✓ With guidance and support from peers and adults, use the steps of the writing process such as plan, draft, revise, edit, and publish to create a narrative writing piece that will be developed and strengthened over an extended time frame (W.3.5) (W.3.10)
- ✓ Make personal connections to concepts presented in *The Human Body: Systems and Senses* through engagement with a class KWL chart (W.3.8)
- ✓ Gather information from brainstorming charts created throughout *The Human Body: Systems and Senses* to develop a narrative piece of writing (W.3.8)
- ✓ Categorize and organize statements and questions about the human body through engagement with the KWL chart used in *The Human Body: Systems and Senses* (W.3.8)
- ✓ Make predictions prior to “Vision: The Parts of the Eye,” naming organs that are protected by the skull based on an image, and then compare the actual outcomes to predictions (SL.3.1a)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

accurate, *adj.* Careful; free of mistakes or errors

Example: Meteorologists use scientific equipment to help them deliver accurate weather forecasts.

Variation(s): none

brain stem, n. The central trunk of the human brain that continues down to the spinal cord

Example: The brain stem is responsible for connecting the spinal cord to the brain.

Variation(s): brain stems

cerebellum, n. The part of the human brain that is found at the bottom and back of the skull and that helps control muscle activity

Example: The cerebellum is like a puppeteer of the body because it controls muscle activity.

Variation(s): cerebellums

cerebral cortex, n. Sheet of nerves that makes up the outer layer of the cerebrum of the human brain and that is responsible for memory, attention, perceptual awareness, thought, language, and consciousness

Example: As you read and learn, your cerebral cortex continues to grow and become thicker.

Variation(s): cerebral cortexes

cerebrum, n. The dominant part of the human brain found in the front of the skull that has two sections and is responsible for regulating most thought processes and voluntary actions in the body

Example: After Ralph had an injury to the front of his head, his doctor immediately ran tests to examine his cerebrum for any brain damage.

Variation(s): cerebrums

dependent, adj. Controlled or determined by something else

Example: Our trip to the beach is dependent on the weather.

Variation(s): none

hemispheres, n. Halves of a sphere; halves of Earth; halves of the cerebrum


Example: Similarly to how Earth's axis splits it into the Northern Hemisphere and the Southern Hemisphere, the brain is also split into two hemispheres.

Variation(s): hemisphere

medulla, n. The lowest part of the brain stem; responsible for involuntary muscle movements

Example: Carlos learned in class that involuntary muscles, like the cardiac muscle, are controlled by the medulla, found in the lowest part of the brain stem.

Variation(s): medullas

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	KWL Chart	10
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	The Nervous System and the Brain	Image Card 15	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions		15
	Word Work: Hemispheres	globe	5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Writing a Narrative: Plan	Instructional Master 6B-1	20
<i>Take-Home Material</i>	Family Letter	Instructional Master 6B-2	



The Nervous System and the Brain

6A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Remind students that the various human body systems are interconnected. Ask students to share what they learned in the previous lesson about how the nervous system is interconnected with the other human body systems. Briefly review the skeletal and muscular systems, referring to the KWL chart as needed. Ask students to explain what the phrase command center means in reference to the nervous system. Review conscious and unconscious/reflex actions, and voluntary and involuntary actions. Ask students to share examples of each type of action. Review that cells are the building blocks of life. Encourage students to explain that different types of cells make up the tissues that make up the different organs in the human body.

To aid in this brief review, you may wish to refer to image supports as needed.

Tell students that today they are going to learn about the different parts of the brain. Ask students to share what they know about the human brain, and ask if they have any questions about the brain and the nervous system. Revisit the 'K' and 'W' sections of the KWL chart and add what students know about the brain and the parts of the brain. Write any questions students have about the brain in the 'W' section of the chart. Encourage students to listen carefully to the information in the read-aloud to correct any misunderstandings and/or to add more information to the KWL chart.

Purpose for Listening

Tell students to listen carefully to learn more about the nervous system, the different parts of the brain, and the brain's function as the command center in the central nervous system.

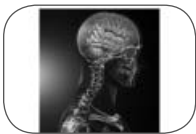


The Nervous System and the Brain

← Show image 6A-1: Ricardo

Hi! I've got lots of fascinating facts to share with you today, so I'm hoping that my brain is in good working order. There's a lot to remember. Raise your hand if you have a brain. Whew! I'm glad all hands went up. Yes, of course you have a brain. All vertebrates have brains. Who remembers what else all vertebrates have? ¹ Right! Backbones! You know that you have a backbone; you've been testing out those wonderfully flexible spines that support your bodies and protect your spinal cords.

1 [Pause for students to answer.]



← Show image 6A-2: The human brain encased in the skull ²

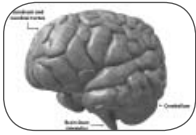
You've learned that your nervous system is a complex network with two essential organs, your spinal cord and your brain. Your spinal cord is connected to your brain by the **brain stem**, the central trunk of the brain. Your brain itself is very soft, but it is well protected by your cranium, or braincase. This strong eggshell-shaped part of your skull is formed from eight interlocking bones, wedged together like the pieces of a jigsaw puzzle.

2 [Point to the brain stem, the cranium, and the skull in the image as you read the following sentences.]

Inside your skull, your brain floats in a clear liquid that cushions it and keeps it from banging against your skull. Your brain is covered in grooves and folds, resembling a huge walnut. About the size of a cantaloupe or a grapefruit, this jellylike, pinkish-gray blob has blood vessels running all through its wrinkled mass. They carry oxygen, water, and other important nutrients to the brain. ³

3 Blood vessels carrying, or circulating, oxygen, water, and other important nutrients to the brain and throughout the body are a part of the circulatory system. So, the nervous system and the circulatory system are interconnected.

The brain, when fully grown, weighs about three pounds. That may seem pretty small and light for such a big body, but humans have larger brains than animals when compared with their body size. So, even though the brains of elephants and whales are actually larger than human brains, their brains are smaller than ours compared with the enormous size of their bodies.



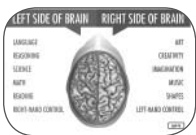
← **Show image 6A-3: Cerebrum, cerebellum, medulla**⁴

- 4 [Point to the cerebrum, cerebellum, and medulla in the image as you read the following sentences.]
- 5 [Show a length of three inches with your thumb and forefinger.]

- 6 So, the nervous system and the digestive system are interconnected.

There are three main sections of the brain. They are the brain stem, the **cerebrum**, and the **cerebellum**. Each part of the brain has an important function. Your brain stem, about as thick as your thumb, is approximately three inches long.⁵ It helps to relay messages between your brain and spinal cord. The bottom third of your brain stem, the part that blends into the top of your spinal cord, is called the **medulla**. The medulla is responsible for many of your body's involuntary, or automatic, muscle movements. The medulla makes sure that your lungs are receiving oxygen by controlling your breathing and making sure your heart is beating. The medulla helps you swallow and break down the food in your digestive system.⁶ The medulla controls your coughs and sneezes and hiccups, as well as your sleeping and dreaming. It also controls the movement of your head and neck.

The cerebrum is the largest part of your brain, filling the whole upper part of your skull. Language, memory, thought, sensations, and decision-making are housed in your cerebrum. Your cerebrum is “the thinking brain” and the part of the cerebrum that does most of the thinking is called the **cerebral cortex**. Your cortex is the deeply wrinkled outer surface of the cerebrum. The more that it is used, the thicker it becomes. In other words, people who use their brains to think a lot develop thicker cortexes. Do you think your cortex is getting any thicker? It is—you are learning a lot each day!



← **Show image 6A-4: Brain hemispheres**

- 7 [Point to the left and the right hemispheres in the image.] Who can point to the axis of the brain? Remember, an axis goes through the center of an object, dividing it into two parts, or hemispheres.
- 8 [Show Image Card 15 (Left-Right Brain; Right-Left Body).]

Let's look more closely at the cerebrum. The cerebrum is divided into two halves, or **hemispheres**.⁷ The two hemispheres of the brain, the left hemisphere and the right hemisphere, are linked to one another by thick nerve fibers. Interestingly, the nerves that connect your cerebrum to the rest of your body cross over to the opposite side as they enter your brain. This means that each hemisphere largely controls the muscles of the opposite side of the body.⁸ The left side of your cerebrum controls muscles on the right side of your body. The right side of your cerebrum controls muscles on the left side of your body.

One hemisphere is usually more developed than another in most people. If you use the right side of your body more—that is, you kick with your right foot and you hold your pencil in your right hand—the left hemisphere is dominant, or in control. It is the left hemisphere that is mostly associated with language, math, and reading.

If, however, you use the left side of your body more—that is, you kick with your left foot and you hold your pencil in your left hand—the right hemisphere is dominant. The right hemisphere is mostly associated with imagination, music, and shapes.



← **Show image 6A-5: What the cerebellum does**

9 [Point to the cerebellum in the image.]

The third part of the brain, in addition to the brain stem and the cerebrum, is called the cerebellum, meaning “little brain.”⁹ Tucked under your cerebrum in the back of your brain, your cerebellum resembles your cerebrum with two hemispheres of its own. Your cerebellum is the control center for balance and coordination. It is constantly adjusting the way your body moves. As you practice any physical activity, such as dancing, your cerebellum receives messages about your body’s actions and positions. It sends commands back to your muscles, adjusting your movements. As your cerebellum gradually becomes more **accurate** in its corrections, you begin to notice improvements in your dancing, or whatever activity you are trying to perfect. For example, if you have learned to ride a bike, chances are you didn’t master it all at once. It took practice. Your cerebellum was in charge of your balance and coordination, making small adjustments with each improvement until you could peddle quickly and furiously on your own without even thinking about it.

Let’s try an experiment to demonstrate what the cerebellum does. Close your eyes and reach your arms out to your sides so your body makes the shape of a ‘T.’ Slowly, bring your arms forward, touching the fingertips together. You may open your eyes now. Was that easy for you? Your cerebellum coordinated your movements for you. If you damaged your cerebellum, you would not be able to do this simple exercise. No matter how hard you tried, your hands would jerk around without any control.



← **Show image 6A-6: Human brain**

10 [Have student volunteers point to each part of the brain on the image.]

Now, let's put all the parts of your brain together. Look at this picture of the brain. See if you can identify the three parts: the brain stem, the cerebrum, and the cerebellum.¹⁰ I'm going to ask you three riddles to test your knowledge and see how well your brain is working. Ready?

11 [Pause for students to answer.]
(cerebrum)

*I am the largest part of the brain, divided into two hemispheres. I am sometimes called "the thinking brain." What am I?*¹¹

12 [Pause for students to answer.]
(brain stem)

*I am only three inches long, but without me the spinal cord would not be connected to the brain. One of my parts is called the medulla. What am I?*¹²

13 [Pause for students to answer.]
(cerebellum)

*I look a lot like the cerebrum with two hemispheres of my own, but I am much smaller. Without me, you would not be able to balance on one leg. What am I?*¹³

Great job, everyone!

Your brain is not very big, and yet it is more powerful than the strongest computer ever created. All other systems of the body are **dependent** upon this complex, three-pound organ that lives inside your skull. Your brain is the center of your memory, thoughts, and feelings. Your brain is in command of your whole body. When your brain stops working, the rest of your body will stop working as well.



← **Show image 6A-7: Ricardo**

14 Who can predict what else may be hidden within the skull by looking at Ricardo's T-shirt?



Well, I think I remembered everything I wanted to tell you today. Next time, we'll look inside your skulls some more to see what else is tucked away within those bones in addition to the brain.¹⁴ See you then!

Comprehension Questions



15 minutes



1. *Inferential* Is your skull one big bone? (No, it is formed by eight interlocking bones, wedged together like a puzzle.) What is another word for *skull*? (*cranium*) Which vital organ does the skull encase? (the brain) Is the brain the only thing within the skull? (No, the brain floats in a clear liquid that cushions the brain and keeps it from banging against the skull.)
- ← **Show image 6A-6: Human brain**
2. *Literal* What are the three sections of the brain? (the brain stem, the lower part of which is also called the medulla; the cerebrum; and the cerebellum) [Have a volunteer point to the three parts of the brain.]
3. *Inferential* How do the nerves and the brain interact? (The nerves are messengers that send information from different parts of the body through the spinal cord to the brain.)
4. *Inferential* What is the medulla, or lower part of the brain stem, responsible for controlling? (the body's many involuntary and automatic movements) Is the medulla responsible for unconscious reflex actions? (No, because some reflex actions do not involve the brain.) What are some examples of what the medulla controls? (breathing, heartbeat, sneezing, etc.)
5. *Inferential* What is the cerebrum responsible for controlling and managing? (language, memory, thought, sensations, and decision-making) What is the part of the cerebrum that does the most thinking? (the cerebral cortex) What happens to the cerebral cortex as it is used more? (It becomes thicker over time.)
6. *Inferential* Is the cerebrum the smallest or the largest part of your brain? (the largest) You heard in today's read-aloud that the cerebrum is divided into two hemispheres. What does each hemisphere control? (Each hemisphere controls the muscles of the opposite side of the body. If you use one side of your body more—for instance if you are right-handed or left-handed—the hemisphere on the opposite side is more developed.)

7. *Evaluative* What is the cerebellum responsible for controlling? (balance and coordination; making movements more accurate each time they are practiced) What would happen if you were to damage the cerebellum? (You wouldn't be able to control your movements.) Are the other systems dependent on or independent of the brain? (dependent on) Why? (The brain and the nervous system are the command center of the whole body. If the brain stops working, the human body stops working.)
8.  *Evaluative* Explain why it is important to wear a helmet when you play sports or ride a bike. Be sure to name at least two parts of the brain in your answer. (Answers may vary.)
9.  *Evaluative* In earlier read-alouds you learned that the skull and the ribs are two of the three axial bones in your body. Compare and contrast the vital organs that these two important axial bones are protecting.

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

10.  *Evaluative Think Pair Share:* Which hemisphere of your cerebrum is more developed? Explain why. (Answers may vary.)
 11. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Hemispheres

5 minutes

1. In the read-aloud you heard, “The cerebrum is divided into two halves, or *hemispheres*.”
2. Say the word *hemispheres* with me.
3. Hemispheres are halves of a sphere or sphere-like object, such as halves of Earth, or halves of the cerebrum.
4. [Point to the United States on a globe.] The United States is located in the Northern Hemisphere, which is the northern half of Earth when separated horizontally at the equator into the Northern Hemisphere and Southern Hemisphere.
5. Earth can also be separated vertically into the Western Hemisphere and Eastern Hemisphere. [Point to places on the globe as students name them.] Name a place in the world (a continent, country, city, or town) and let’s see in which of the hemispheres that place is located. Be sure to use the word *hemispheres* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “_____ is located in the _____ Hemisphere.”]
6. What’s the word we’ve been talking about? What part of speech is the word *hemispheres*?

Use a *Sharing* activity for follow-up. Directions: Turn to your partner and take turns sharing spherical things or other things that can be divided into hemispheres. I will call on one or two of you to share your answers with the class. As you share, be sure to use the word *hemispheres* in a complete sentence.



Complete Remainder of the Lesson Later in the Day



The Nervous System and the Brain

6_B

Extensions

20 minutes

Writing a Narrative: Plan (Instructional Master 6B-1)

Ask, “Who can tell me what a narrative is?” Remind students that *narrative* is another word for *story*, such as *The Wind in the Willows* narrative they have heard.

Ask, “Who can tell me the parts of a narrative?” Remind students that narratives, or stories, have characters, settings, and plots. Review the meaning of these terms and provide examples if necessary. Remind students that narratives also often have narration and dialogue. Ask, “Who can tell me the difference between narration and dialogue?” You may wish to share examples from *The Wind in the Willows* or from other narratives students have heard, read, or written.

Explain to students that fictional narratives are often divided into three sections: beginning, middle, and end. Tell students that they are each going to write a fictional narrative consisting of at least three paragraphs—one for the beginning of the story events, one for the middle, and one for the end. Tell students that their narratives will also include dialogue. Remind students that each time a new speaker says something, a new paragraph is formed. Explain that they will write these dialogue paragraphs in addition to the three main paragraphs of their narrative.

Ask, “Who can tell me the steps of the writing process?” Review the steps—plan, draft, revise, edit, and publish—and tell students that today they will begin the first step of their narratives together: plan. Remind students that they completed these steps together when writing an opinion paragraph in the *The Wind in the Willows* domain and an informational paragraph in the *Classification of Animals* domain. Explain that now they are going to apply these steps to a fictional narrative piece of writing.

Tell students that they are each going to write a fictional narrative related to what they have learned about the human body. Remind students that a fictional narrative is created from the author’s imagination and sometimes has elements of fantasy, or things that cannot happen in real

life. Ask students for ideas and display these topics. You may also wish to suggest a topic of your own or one from the following list:

- a day in the life of an organ in a particular system
- a character who experiences a broken bone and receives medical treatment
- a story from the perspective of a doctor or patient
- a story from the perspective of an eye or an ear
- a story from the perspective of a blind or deaf person

Note: You may wish to have some students write a nonfiction narrative or narrative biography related to the human body, such as a retelling of a medical discovery or invention, or a biography of Helen Keller, Ray Charles, or other person related to science or medicine.

Give each student a copy of Instructional Master 6B-1. You may wish to make copies for students to create several brainstorming charts and help them choose one. Tell students that they are going to fill out the three sections of the chart—character(s), setting(s), and plot. Tell students that they can use their imaginations, what they already know, and what they have learned about the human body to generate ideas.

You may also wish to allow students to research topics further, using domain-related trade books in the classroom book tub and/or other sources. If students include information that they find in these sources, be sure to remind them that they need to write this information in their own words in order to avoid plagiarism. Remind students that plagiarism is the act of taking other people’s work exactly as it is written and using it as your own. You may need to guide students in how to reword information that they may wish to use.

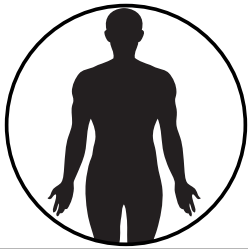
If students complete multiple brainstorming charts, you may wish to have them decide the same day which topic they would like to write a narrative about, or you may wish to allow students time to think about it and decide the next time you meet. Tell students that they will begin the drafting step the next time you meet to work on writing. If students decide the same day on a topic, tell them to be thinking of a title for their narratives. You may also choose to have students wait until after their first draft to begin thinking of a title.

Note: You may wish to model this step of the writing process for some students. You may also wish to have students work with partners or in groups. You may need to take more than one day to complete this step of the writing process, as the narrative is longer than other genres previously taught.

Take-Home Material

Family Letter

Send home Instructional Master 6B-2.



Vision

The Parts of the Eye

7

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✓ Explain that the five senses work with the brain to process information about our surroundings
- ✓ Identify the surrounding parts of the eye: eye sockets, eyebrows, eyelids, and eyelashes
- ✓ Identify the outer parts of the eye: sclera, cornea, iris, and pupil
- ✓ Identify the inner parts of the eye: lens, retina, and optic nerve
- ✓ Explain how the parts of the outer and inner eye work together with the brain to allow a person to see
- ✓ Describe nearsightedness and farsightedness and how these can be corrected

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe the relationship between the parts of the eye in “Vision: The Parts of the Eye” using language that pertains to sequence and cause/effect (RI.3.3)
- ✓ Interpret information from a KWL chart created in *The Human Body: Systems and Senses* (RI.3.7)
- ✓ Describe images and how they contribute to what is conveyed about the parts of the eye in “Vision: The Parts of the Eye” (RI.3.7)

- ✓ Use a Character/Setting/Plot graphic organizer to aid in planning and drafting a narrative writing piece that establishes a situation and introduces a narrator and/or characters, and organizes an event sequence that unfolds naturally (W.3.3a)
- ✓ Identify and use parts of a paragraph, including a lead sentence, supporting details, and a concluding statement, in a narrative piece (W.3.3a)
- ✓ Continue development of a narrative writing piece that uses dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations (W.3.3b)
- ✓ Use temporal words and phrases to signal event order in a narrative piece (W.3.3c)
- ✓ Provide a sense of closure in a narrative piece (W.3.3d)
- ✓ With guidance and support from peers and adults, use the steps of the writing process such as plan, draft, revise, edit, and publish to create a narrative writing piece that will be developed and strengthened over an extended time frame (W.3.5) (W.3.10)
- ✓ Categorize and organize statements and questions about the human body through engagement with the KWL chart used in *The Human Body: Systems and Senses* (W.3.8)
- ✓ Gather information from brainstorming charts created throughout *The Human Body: Systems and Senses* to develop a narrative piece of writing (W.3.8)
- ✓ Follow up on earlier predictions prior to hearing “Vision: The Parts of the Eye” about which organs are protected by the skull based on an image, and then compare the actual outcomes to predictions (SL.3.1a)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

cornea, n. The thin tough tissue that covers the colored part of the eye
Example: Judah’s cornea protected the colored part of his eye from the grain of sand.
Variation(s): corneas

farsightedness, n. The ability to clearly see faraway objects but not nearby objects
Example: Due to her farsightedness, Ceely could not read the book when held closely to her eyes, but instead had to hold the book at arm’s length.
Variation(s): none

iris, n. The colored part of the eye that controls the size of the pupil
Example: Simone has blue eyes, but taking a closer look shows that she also has gold and brown flecks in the iris.
Variation(s): irises

lens, n. The small, flexible part of the eye that focuses light to produce an image
Example: The lens is a useful part of the eye that allows us to focus in on something we see.
Variation(s): lenses

nearsightedness, n. The ability to clearly see nearby objects but not faraway objects
Example: Ted has nearsightedness, so he could not read the sign that was far down the road.
Variation(s): none


pupil, n. A small, black opening in the center of the colored part of the eye that controls how much light can enter
Example: The pupil becomes larger in the dark in order to see better, whereas it becomes smaller in bright light in order to protect the eye.
Variation(s): pupils

retina, n. A part of the eye that lies along the back, inner wall of the eyeball and that allows us to see shades of gray in dim light, as well as colors and sharp images in bright light
Example: The retina serves as both a receiver and transmitter because it receives images and then transmits them to the brain.
Variation(s): retinas

wondrous, *adj.* Amazing; miraculous; awesome

Example: After the blizzard, Amy was amazed at the wondrous amounts of snow that blanketed the streets and piled against the houses.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	KWL Chart	10
	What Do We Know?	KWL Chart; drawing paper, drawing tools	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Vision: The Parts of the Eye	Image Card 2	20
<i>Discussing the Read-Aloud</i>	Comprehension Questions		15
	Word Work: Wondrous		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Writing a Narrative: Draft	Instructional Masters 6B-1 and 7B-1	20



Vision

The Parts of the Eye

7A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Remind students that the various human body systems are interconnected. Ask students, “What are the names of the systems you have learned about so far?” (skeletal, muscular, and nervous systems) Ask students to share what they remember about the muscular and skeletal systems, using the KWL chart for support as needed. Reread any riddles about these two systems and have students provide the answers.

Review the nervous system with students, showing students images from the read-aloud if needed. Add any new information about the nervous system to the KWL chart, especially facts learned about the different parts of the brain. Reread any riddles about the nervous system and have students provide the answers.



What Do We Know?

← Show image 7A-1: Ricardo

Ask students if their predictions were correct about what, in addition to the brain, is hidden in the skull. Then tell them that today they will be learning about their eyes and the different parts that work together that allow them to see. Remind students that from the first moment when we open our eyes in the morning, we use our vision to help us get around. Our vision helps keep us safe by helping us avoid bumping into objects, walking into traffic, and so on.

Note: You may wish to discuss with students how people with limited or no vision operate throughout the day with things like seeing-eye dogs, walking canes, Braille, etc.

Revisit the ‘K’ and ‘W’ sections of the KWL chart and add what students know about their eyes. Write any questions students have about their eyes in the ‘W’ section of the chart. Encourage students to listen carefully to the information in the read-aloud to correct any misunderstandings and/or to add more information to the KWL chart.

Remind students of the observations they made based on what they saw when they learned about classifying animals, and tell them that observation is an important part of the learning process for scientists. Tell students that you would like them to closely look at a partner's eye. Ask them to draw the different parts of the human eye that they observe, and to label the parts that they know. Give students a few minutes to make their observations and drawings. You may also wish to draw the parts of the human eye on a piece of chart paper, a chalkboard, or a whiteboard. Review with students the parts that they may already know. (eyelid, eyelash, eyebrow, tear duct, iris, pupil) Remind students that when studying the human body's systems and senses, there are things on the outside that are easily seen, like eyelashes; these are called external body parts. There are also things on the inside, like bones, that cannot be seen without the help of machines such as x-rays; these are called internal body parts. Tell students that today they will learn about both the internal and external parts of the human eye.

Purpose for Listening

Tell students to listen carefully to find out details about how the eyes work and how vision helps us understand the world around us.



Vision: The Parts of the Eye

← Show image 7A-1: Ricardo

Imagine a typical day. You are always looking around at people and books and screens, at animals and cars and trees. Before crossing a street, you look both ways for traffic. What part of your body do you use to look at all these things? Your eyes, of course! And which body organ do you think helps your eyes to see? Yes—the **wondrous** brain. Human eyes work together with the brain in order to see.

Of all your senses, your sense of sight is the one you use the most. More than half of all the information you collect from your environment is received through your eyes. Then, the information is sent to the back of your brain, sometimes called the “mind’s eye,” where your brain interprets what your eyes see and creates a picture for you.



← Show image 7A-2: Eye composite

- 1 Point to your skull. [Show students Image Card 2 (Skull) and point to the cranial bones as you read the following sentences.]
- 2 [Demonstrate for students where their eye sockets are located.] You can feel your eye sockets by gently touching the area around your eyeball.

Remember when we looked at the different parts of the skull?¹ The cranium that houses your brain is only one part of your skull. Besides the eight, flat, cranial bones, there are twenty additional skull bones. Some of these bones form the eye sockets, two holes that are the perfect size for housing and protecting your eyeballs.²

Before we take a look at an eyeball, let’s look at what surrounds your eyes. There are other things that also play an important part in helping you to see. Turn and look at your neighbor. See the hairs above the eyes? What are they called? Right—the eyebrows. They’re not just there to look pretty. They have a purpose. Does anyone know what they do? Your eyebrows help keep dust and sweat out of your eyes. Now, close your eyes. What is the skin called that covers your eyes? Yes—eyelids. Your eyelids protect your eyes, too, keeping your eyes moist by spreading tears over them. Tears are produced by tear glands, located above each eyeball on the under side of the eyelid. These salty water droplets

- 3 Normally these tear ducts do their job of draining without you even knowing it. What do you think you would be doing if your tear ducts couldn't drain a lot of tears fast enough? (crying!)
- 4 The eyelids, eyebrows, and eyelashes are all external parts that help protect the eyeball.

keep your eyes wet and help fight germs. Tear ducts are tiny, raised bumps located in the inner corner of your eyes, containing openings no larger than a pinhole. These tiny openings are the drains for your tears!³ Your eyelashes, the short curved hairs growing on the edge of your eyelids, keep dust particles out as well. There are muscles all around each eye—six in all. They control your eyes' movements, allowing them to swivel in their sockets, looking up and down and side to side.⁴

Now we're ready to take a peek at the parts of your eyeball itself. Look at your neighbor again. What shape is his or her eyeball? It may appear oval to you, but the eyeball is actually well named because it is round, just like a basketball. It looks oval because some parts are hidden behind the eyelids.

What color were your neighbor's eyes? Did you notice? Look again. Does anyone know the name for the colored part of the eyes?



← **Show image 7A-3: Close-up of eye (sclera, cornea, iris, pupil)**

Let's find out. Look at this picture together. The outer, visible part of the eye includes the sclera, **cornea**, **iris**, and **pupil**. The white, outer layer of the eye is called the sclera. The thin, tough, transparent tissue that covers the colored part of the eye is called the cornea, and it allows light to pass through. Together, the sclera and the cornea protect the eye from germs, dangerous particles, and damaging light rays. The colored part of the eye, the disc located just behind the transparent cornea, is called the iris. At the center of the iris is a black circle. Do you see it? This dark circular hole, called the pupil, varies in size as it regulates the amount of light entering the eye. The muscles of the iris control the size of the pupil, tightening to make the pupil smaller in bright light, and relaxing to make the pupil larger in dim light.

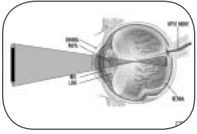


← **Show image 7A-4: Inside the human eye**⁵

- 5 [As you read the following sentences, point to the diagram.]

You can only see clearly if the right amount of light enters your eyes. Eyes are designed to focus light. Every part of the eye has a role to play, including those parts that lie inside the eyeball. So, what *is* inside the eyes? Liquid and jelly! That's right—eyes are

soft and hollow; the clear fluid and jelly inside them give them their round shape. There are three important parts *inside* the eyeballs that help you see: the **lens**, the **retina**, and the optic nerve.



← **Show image 7A-5: Sight diagram**

In order to see, you need light. It can be natural light from the sun or electrical light from a bulb, but all seeing begins with light. The eye sees objects by seeing the light that reflects, or bounces off, objects. Imagine that you are looking at a house. The sun shines down on the house. Light from the sun bounces off the house and travels to your eyes.

Light rays bend toward each other as they pass through the cornea, the transparent tissue that covers the iris. This bending is the first step in focusing the light. The bent light rays then pass through the pupil to a clear disc called the lens. The rubbery, flexible lens adjusts its shape in order to focus on near or distant objects, creating crisp images. As the light rays pass through the lens, they bend even closer, cross one another, and land on the cup-shaped retina at the back of the eye. An image of the house is formed on the retina, but because light rays are bent, the image appears upside down on the retina. The light-receiving cells of the retina transfer light rays into electrical energy so that the nervous system can send information to your brain via the optic nerve. The short, thick, optic nerve is fixed to the back of the eyeball, just behind the retina. Acting like a cable, it passes through a tunnel in the skull and connects the eyeball to the brain. The optic nerve carries messages to the brain to be processed. The brain recreates the image so that the house is now seen right side up! As the eyes work together with the nervous system, this whole process takes less than one second to complete.⁶

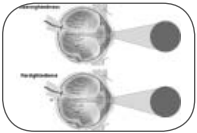
6 When you think of the factors and parts of the eye that are involved in allowing us to see, it is indeed wondrous to think that it takes less than one second to see!

Eyes are so important to us that it is troubling when things go wrong with our eyes, preventing us from seeing as well as we would like. Two of the most common eye problems are **nearsightedness** and **farsightedness**. Have you heard those terms before? Let's find out what they mean.



← **Show image 7A-6: Diagram of nearsightedness and farsightedness**

We know that people come in all shapes and sizes. Look around you. Legs and arms and faces and heads are all different shapes and sizes. So, it makes sense that eyes vary in shape and size from person to person, too. The size and shape of the eye affects its ability to focus light and work well. In perfect vision, as light rays pass through the lens of the eye, they meet in just the right place to project a clear image on the retina. But sometimes the cornea or the lens is not quite the right shape to bend the light in the most effective way. Sometimes the shape of the eyeball affects how clearly images are projected on the retina. When these things occur, vision may become blurry.



← **Show image 7A-7: Light entering the eye**

In nearsightedness, the eyeball's size in relation to the cornea affects its focusing power, so images are projected, or focused, in front of the retina. Nearby objects are seen clearly, but distant objects are out of focus. In farsightedness, the eyeball's size affects the focusing power of the lens, so images are projected, or focused, behind the retina. Distant objects are seen clearly, but nearby objects are out of focus. Luckily, these problems can both be corrected with glasses or contact lenses.⁷

7 Who can tell us what contact lenses are?



← **Show image 7A-8: Ricardo**

Before I go, let's try a riddle or two:

*I reflect off objects and enter your eyes. I bend to help you see. Your sight depends on me. What am I?*⁸

*Objects appear upside down on me. I live at the back of your eyeball. What am I?*⁹

*I am the part of your eye that is colored. Sometimes I'm green, but I could be brown, or gray, or blue. What am I?*¹⁰

8 [Pause for students to answer.]
(light)

9 [Pause for students to answer.]
(retina)

10 [Pause for students to answer.]
(iris)

OK, it's time for me to go! Next time we'll look at the smallest bone in your body. Can anyone predict where it is? Hint: It's part of another sensory organ.

Comprehension Questions

15 minutes







1. *Literal* What are your five senses? (sight, hearing, smell, taste, touch) How do these senses work with the brain to process information about our surroundings? (Information about the environment is collected through the senses and is sent back to the brain for interpretation.)

← **Show image 7A-3: Eye up-close (sclera, cornea, iris, pupil)**

2. *Inferential* What are the visible, or external, parts of the eye? (eye sockets, eyebrows, eyelids, eyelashes, sclera, cornea, iris, and pupil) What is the purpose of these visible parts? (Eyebrows and eyelashes keep away dust, sweat, and other particles; eyelids and tear ducts keep the eyeball moist; the pupil controls how much light enters the eyeball; the sclera and cornea protect from germs, particles, and light rays; eye sockets are the “house” and protect the eyeball.)



← **Show image 7A-4: Inside the human eye**

3. *Literal* What are the inner, or internal, parts of the eye? (lens, retina, and optic nerve)
4.  *Evaluative* Compare and contrast nearsightedness and farsightedness. (In nearsightedness, you can clearly see things that are close, but not things that are far away. In farsightedness, you can clearly see things that are far away, but not things that are close.)
5.  *Evaluative* If you were an optometrist, how would you help a person deal with the challenges of nearsightedness or farsightedness? (have the person wear eyeglasses or contact lenses.)
6.  *Evaluative* Describe how the parts of the eye work together with the nervous system to allow a person to see. (Light travels through the cornea, and as it passes through, the light bends. The bent light passes through the pupil to the lens. The lens bends the light again to finish focusing the image. This light lands on the retina, where the light is transferred to electrical energy so the optic nerve can send information to the brain.) Would you describe this process as wondrous? Why or why not? (Answers may vary.)
7.  *Evaluative* Why is it very important to take care of and protect the eyes? How can you do this? (Answers may vary, but should include that sight is the most frequently used sense, and we learn a great deal through the sense of sight.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

8. *Evaluative Think Pair Share:* Your sense of sight is the one you use the most. How does the sense of sight help you on a daily basis? (Answers may vary.)
 9. After hearing today’s read-aloud and comprehension questions and answers, do you have any remaining questions?
- ✈ You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Wondrous

5 minutes

1. In the read-aloud you heard, “And which body organ do you think helps your eyes to see? Yes—the *wondrous* brain.”
2. Say the word *wondrous* with me.
3. *Wondrous* means amazing, miraculous, or awesome.
4. Juan is a skilled artist who creates such *wondrous* paintings!
5. What is something you think is *wondrous*, and why do you think that? Be sure to use the word *wondrous* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I think _____ is *wondrous* because . . .”]
6. What’s the word we’ve been talking about? What part of speech is the word *wondrous*?

Use a *Brainstorming and Sharing* activity for follow-up. Write the word *wondrous* in an oval on a piece of chart paper, a chalkboard, or a whiteboard. Have students say words that come to mind when they think of the word *wondrous*. Write the students’ words on spokes coming out from the oval. If necessary, guide students with synonyms such as *amazing*, *miraculous*, *awesome*, *incredible*, and *wonderful*. Ask students if they have ever seen or witnessed something that was *wondrous*. As students share, make sure they use the word *wondrous* in a complete sentence.



Complete Remainder of the Lesson Later in the Day



Vision

The Parts of the Eye

7_B

Extensions

20 minutes

Writing a Narrative: Draft (Instructional Masters 6B-1 and 7B-1)

Remind students of the four steps of the writing process—plan, draft, edit, and publish. Remind them that in the previous lesson they began the planning step of their narratives. Tell students that today they are going to finish the planning step and begin the next step: draft. Remind students that this means that they are going to start writing sentences.

Give students their copies of Instructional Master 6B-1. If students created multiple charts, have them review them and decide upon a topic for their narratives. Remind students that they are going to use the words and phrases from each section of their brainstorming charts to create sentences for their narratives about the character(s), setting(s), and plot.

Remind students that they will write at least three paragraphs—one for the beginning of the plot, one for the middle of the plot, and one for the end of the plot.

Have students write any ideas for a title on their brainstorming chart. Tell students that they will revisit these when their first draft is finished to see if one of them is a fitting choice.

Remind students that in the opinion and informational paragraphs they have written together and on their own, they have begun their paragraphs with a certain type of sentence. Ask, “Who can tell me the name for the type of sentence we have used to begin our opinion and informational paragraphs?” (topic)

Tell students that a topic sentence is different from the first line of a narrative, which is sometimes called a “hook” or lead sentence. Explain that the purpose of this “hook” sentence is not necessarily to tell the reader what the story is about, but instead to get the reader interested immediately in the story. Tell students that a narrative may begin with dialogue, a hint of what the story is about, or a mysterious statement that causes the reader to be curious to find out more about the story. For example, a first sentence for a narrative may be, “I, the brain, never felt so powerful as I did at that moment” or “I never knew a visit to the doctor could be so interesting.”

Remind students that the narrative they are going to write will have more than one paragraph, so each paragraph may have its own “hook” sentence.

Give each student a copy of Instructional Master 7B-1. Have students create sentences from the words and phrases on their brainstorming chart to write the beginning, middle, and end paragraphs of their narrative. Remind students to include dialogue, using quotation marks around it and commas to introduce it as needed. Also remind students to create new paragraphs each time different speakers are introduced.

As students write sentences for their drafts, remind them to use transitional words—such as *before*, *after*, *then*, *finally*, *since*, *because*, etc.—between sentences and paragraphs to show chronology as well as cause and effect. Also, remind students to use capital letters at the beginning of sentences, punctuation at the end, and commas between things in a list. Remind students that they will check the grammar and spelling during the editing step, but that they should try to pay attention to these things as they are writing their draft as well.

Remind students that in the opinion and informational paragraphs they have written, they have ended their paragraphs with a certain type of sentence. Ask, “Who can tell me what type of sentence we have used to end our opinion and informational paragraphs?” (concluding) Remind students that although a concluding sentence is used in opinion and informational writing to conclude—or wrap up—the paragraph, in narrative writing the last sentence of each paragraph or the final sentence of the story does not necessarily restate the first sentence of the paragraph or story. Explain that sometimes a narrative may end with dialogue, a curious or mysterious statement that causes the reader to wonder about the story, or a sentence that explains something about the story that the reader has been waiting to find out. For example, an ending sentence for a narrative may be, “I’ve never been the same organ since”; or, “After everything I learned today, I’ve decided that I want to be a doctor when I grow up.”

Have students read over their completed paragraphs. Tell them to look again at their title ideas to see if one of them is a fitting choice. Tell students that they are going to continue to work on their drafts during the next writing session. Encourage students to be thinking of any other title ideas and changes they think are needed in their paragraphs. Tell students that you will help them to revise, or change, their paragraphs during the next draft.

Note: You may wish to model this step of the writing process for some students who are not ready to complete it independently. You may also wish to have some students work with partners or in groups. You may need to take more than one day to complete this step of the writing process, as the narrative is longer than other genres previously taught.



Hearing

The Parts of the Ear

8

✔ **Lesson Objectives**

Core Content Objectives

Students will:

- ✔ Explain that the five senses work with the brain to process information about our surroundings
- ✔ Identify the outer parts of the ear: earflap, earlobe, ear canal, and eardrum
- ✔ Identify the middle parts of the ear as the three ear bones: hammer, anvil, and stirrup
- ✔ Identify the inner parts of the ear: cochlea and auditory nerve
- ✔ Explain that cochlear implants can help some people who cannot hear
- ✔ Explain that an important function of the inner ear is to provide balance
- ✔ Describe how sound travels through all the parts of the ear
- ✔ Describe how the parts of the ear work together with the brain to allow a person to hear

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✔ Describe the relationship between the parts of the ear in “Hearing: The Parts of the Ear” using language that pertains to sequence and cause/effect (RI.3.3)
- ✔ Interpret information from a KWL chart created in *The Human Body: Systems and Senses* (RI.3.7)

- ✓ Describe images and how they contribute to what is conveyed about the parts of the ear in “Hearing: The Parts of the Ear” (RI.3.7)
- ✓ Use a Character/Setting/Plot graphic organizer to aid in drafting and revising a narrative writing piece that establishes a situation and introduces a narrator and/or characters, and organizes an event sequence that unfolds naturally (W.3.3a)
- ✓ Identify and use parts of a paragraph, including a lead sentence, supporting details, and a concluding statement, in a narrative piece (W.3.3a)
- ✓ Continue development of a narrative writing piece that uses dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations (W.3.3b)
- ✓ Use temporal words and phrases to signal event order in a narrative piece (W.3.3c)
- ✓ Provide a sense of closure in a narrative piece (W.3.3d)
- ✓ With guidance and support from peers and adults, use the steps of the writing process such as plan, draft, revise, edit, and publish to create a narrative writing piece that will be developed and strengthened over an extended time frame (W.3.5) (W.3.10)
- ✓ Categorize and organize statements and questions about the human body through engagement with the KWL chart used in *The Human Body: Systems and Senses* (W.3.8)
- ✓ Make personal connections to concepts presented in *The Human Body: Systems and Senses* through engagement with a class KWL chart (W.3.8)
- ✓ Make predictions prior to the read-aloud “Hearing: The Parts of the Ear,” about how sound travels through the ear based on the title and/or text heard thus far, and then compare the actual outcomes to predictions (SL.3.1a)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

cochlea, n. The spiral-shaped organ filled with fluid and hair cells that allows a person to hear

Example: When Marcus first saw a picture of the cochlea, he thought it looked like a snail lived inside the ear.

Variation(s): cochleae, cochleas

ear canal, n. The tunnel-like passage that leads from the earflaps to the eardrum

Example: You must be careful not to stick objects into your ear canal.

Variation(s): ear canals

eardrum, n. The thin, stretched membrane across the ear canal that vibrates when sound waves hit it

Example: When sound passes through the ear canal, it hits the eardrum as it moves to the middle ear.

Variation(s): eardrums

impulses, n. Electrical signals carried through the nerves of the ear to the brain enabling someone to hear sound

Example: The sound of the hammer hitting the fence sent nerve impulses through my ear to my brain to help me understand what I was hearing.

Variation(s): impulse

inner ear, n. The deep part of the ear that has semicircular canals and the cochlea and that helps hearing and balance

Example: Sivan went to the doctor because her ear was aching, and the pediatrician discovered she had an inner ear infection.

Variation(s): inner ears

middle ear, n. The main hollow space of the ear behind the eardrum and before the inner ear


Example: The baby kept tugging on her ear, causing her father to worry she had a middle ear infection.

Variation(s): middle ears

outer ear, n. The outer portion of the ear that consists of flaps, the ear canal, and the eardrum

Example: Before sound can get inside the human ear, it has to pass through the outer ear.

Variation(s): outer ears

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	KWL Chart	10
	Making Predictions about the Read-Aloud	drawing paper, drawing tools; chart paper, chalkboard, or whiteboard	
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	Hearing: The Parts of the Ear		20
<i>Discussing the Read-Aloud</i>	Comprehension Questions		15
	Word Work: Impulses	chart paper, chalkboard, or whiteboard	5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Writing a Narrative: Draft/Revise	Instructional Masters 6B-1, 7B-1, 8B-1, and 8B-2	20



Hearing

The Parts of the Ear

8A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Remind students that the various human body systems are interconnected. Ask, “What are the names of the systems you have learned about so far?” (skeletal, muscular, nervous systems) Ask students to share what they remember about these systems, using the KWL chart for support as needed. Reread any riddles about these two systems and have students provide the answers.

Ask students, “What does the term *sensory organ* mean?” (an organ that allows you to use one of your five senses) Review the parts of the eye, showing students images from the read-aloud if needed. Remind students that when eyes are seeing, there is a sequence, or order, by which each part of the eye receives and processes the light that is coming into the eye. Ask for a volunteer to explain the route the light takes. (First light passes through the cornea, then the pupil, next, the lens, and finally it lands on the retina.) Add any new information about the nervous system to the KWL chart, especially facts learned about the different parts of the eye, and how they work together to allow us to see. Reread any riddles about the nervous system and have students provide the answers.

Making Predictions About the Read-Aloud

Tell students that today they will be learning about their ears and the different parts that work together to allow them to hear. Ask students to make predictions about whether or not sound travels in a sequence, or order, through the ear parts, similar to how light travels through the eye. You may wish to record their responses on the KWL chart and address the responses during the Discussing the Read-Aloud section.

Note: You may wish to discuss with students how people who are deaf can communicate with others through sign language, by reading lips, and with computers.

Revisit the 'K' and 'W' sections of the KWL chart and add what students know about their ears. Write any questions students have about their ears in the 'W' section of the chart. Encourage students to listen carefully to the information in the read-aloud to correct any misunderstandings, and/or add more information to the KWL chart.

Remind students that observations are an important part of the learning process for scientists. Then tell them that you would like them to closely look at a partner's ear. Ask them to draw the different parts of the ear that they observe, and to label the parts that they know. Give students a few minutes to look at a partner's ear and draw the various parts. You may wish to also draw the parts of the ear on a piece of chart paper, a chalkboard, or a whiteboard. Review with students the parts that they may already know, such as the earlobe. Remind students that when studying the human body's systems and senses, they will learn about both internal and external parts.

Purpose For Listening

Tell students to listen carefully to find out details about how the ear works and how hearing helps us understand the world around us.



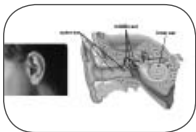
Hearing: The Parts of the Ear

← Show image 8A-1: Ricardo

Hear ye! Hear ye! Today we're going to poke around in your skull once more to learn about another one of your sensory organs. I'll give you a hint with another one of my special riddles:

*We are located near your eyes. There are two of us. My twin hangs out on the opposite side of your head. We both hate the sound of sirens. What are we?*¹

1 [Pause for students to answer.]



← Show image 8A-2: Ear up-close

Yes—your ears! Your ears work together with your brain to help you hear. Think about all the different sounds you hear throughout your day. You hear alarm clocks, water running, doors opening, horns honking, bells ringing, people talking, and so much more. Your ears are very important in the classroom where you need to listen in order to learn. Your ears will help you thicken your cerebral cortex! You are going to hear about all the parts of the ear that work together as an interconnected system.

Your ear is divided into three sections: the **outer ear**, the **middle ear**, and the **inner ear**. Just like your eyes, only part of your ears is visible. The other parts are hidden inside the protective bones of your skull.

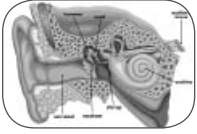
Mammals are the only animals with outer ears. The outer ear consists of flaps on either side of your head, the **ear canal**, and the **eardrum**.² Your outer earflaps are called pinnae [*PIN*-ah]. They are made of skin and a tough elastic tissue called cartilage. Who remembers which other parts of the body contain flexible cartilage?³

The bottom part of each earflap, or pinna, is called an earlobe.⁴ It is much softer than the top part because it does not contain any cartilage. Some earlobes are attached to the side of the head, whereas others dangle loose. Do you know which sort you have? Turn to your neighbor and ask.

2 Think about these two words: *canal* and *drum*. What hints do they give you about how these ear parts work and function? (A canal is a pathway, and a drum vibrates when hit to produce sound.)

3 Your ears, nose, ends of bones, and vertebrae contain cartilage.

4 Touch your earlobe, the bottom part of your pinna.



← **Show image 8A-3: Human ear (ear canal, eardrum, hammer, anvil, stirrup, cochlea, auditory nerve)**

- 5 [Have students look at their pinky fingers to help visualize the length of the ear canal.]
- 6 I'll give you a hint: earwax serves a similar purpose to that of tears. So, an analogy would be "earwax is to ears as tears are to eyes."

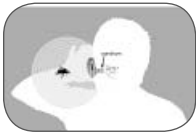
Shaped something like a cup, your outer ear is a sound catcher. It collects sound waves from the air around you and funnels them through your ear canal to your eardrum. Your ear canal is like a tunnel, about half as long as one of your pinky fingers.⁵ The inside of the ear canal is lined with tiny hairs, and earwax is constantly being produced by glands beneath the soft skin. Can anyone guess what earwax does?⁶ Earwax prevents infections by keeping dirt and other particles from building up in the ear canal. At the end of the ear canal, sound bounces off of a thin, flexible flap of skin that stretches across the end of this tunnel. This membrane, or thin skin flap, is called an eardrum because sound vibrates off it in the same way that sound vibrates off the top of a drum when it is pounded with a drumstick. Your eardrum separates your outer ear from your middle ear.

Your middle ear is a tiny, air-filled space just behind your eardrum. As the eardrum vibrates, or shakes, three itty-bitty bones inside the middle ear begin to move, too. These three bones are named for their shapes: the hammer, the anvil, and the stirrup. They are the smallest bones in your body. The stirrup is the smallest of the three, no bigger than a grain of rice. These three tiny bones form a chain, held in place by muscles, that leads from the middle ear to the inner ear.

Okay, it's time for an experiment. Close your mouth and form a puddle of spit inside your mouth. As you swallow your spit, listen closely. Did you hear anything? You should hear a little click. The middle ear is linked to the back of your throat by a narrow tube. Whenever you swallow, chew, or yawn, the tube opens to let air travel in and out of your middle ear. That keeps the air pressure constant on either side of your eardrum, preventing it from bursting. Have your ears ever felt clogged in an airplane or while riding in a car over a mountain? Suddenly, you hear a loud pop and they are fine again. The tube connecting your throat to your middle ear opened up. Thank goodness!⁷

- 7 Ears also have to "pop" when you go to deeper places. People who scuba dive and swim deep in the ocean learn different ways to help their middle ears maintain the correct amount of air pressure while they're under water.

8 Who can tell me what the function of the optic nerve is? (connects the eyeball to the brain, relaying what is seen by the eyes to the brain for processing) What do you think is the job of the auditory nerve? (to send information that is heard to the brain for processing)



← **Show image 8A-4: How hearing works**

Your inner ear is located inside your skull. It is the most complicated and delicate part of the ear, consisting of a maze of tubes inside a liquid-filled, bony, hollow space. At the end of the maze is a snail-shaped, coiled, bony tube, filled with fluid. This part of your ear, lined with tiny hairs, plays a very important part in hearing. It is called the **cochlea**, which means “snail” in Latin. Some people who cannot hear get *cochlear implants*, invented devices that function just like the cochlea functions. The second part of the inner ear is the auditory nerve, which can be likened to the optic nerve of the eyeball.⁸

So, just exactly how do ears work? Your ears collect sound waves, or vibrations. Sound waves are tiny, invisible movements in the air. Sounds are only heard when these waves bump against the outer ear and get funneled into your ear canals. Different sounds have different wave patterns. Loud sounds, such as the sound of a jackhammer, have larger waves than softer sounds, such as the purring of a cat. The louder the sound, the larger the vibration is inside your ear. For you to hear sounds, vibrations must travel from your outer ear, through your middle ear, to your inner ear, and on to your brain for processing. Let’s follow a sound wave through an ear to see how it works.

First, the outer ear, or sound catcher, collects sound waves and channels them into the ear canal. Once the sound waves are channeled into the ear, they hit the eardrum, causing it to vibrate. As the eardrum vibrates, so do the three bones in the middle ear. Next, hinged together by miniature joints, the hammer hits the anvil, and the anvil hits the stirrup. All these vibrations in the middle ear cause liquid in the inner ear to vibrate as well.⁹

Wrapped inside the cochlea is a long, narrow ribbon with thousands of hearing cells, each loaded with tiny hairs. The vibrations in the middle ear create waves in the fluid of the inner ear, which cause the tiny hairs of the cochlea to ripple as well. Next, the sensory hair cells bend and stretch, producing nerve

9 Let’s review these first few steps of hearing before we move on to the rest. [Encourage students to use sequencing words to retell the initial steps of hearing.]

impulses. These signals are carried on nerve fibers, or threads, along the auditory nerve to the hearing center of the brain. The brain is able to recognize the nerve impulses, or signals, as sound, even determining the direction from which the sound comes. The brain receives lots of different vibrations at the same time and is able to tell the signals apart, passing the information along to you and allowing you to hear. These signals hardly ever get mixed up in your amazing brain.¹⁰ For some people, hearing is difficult or even impossible when one or more parts of this system are not working properly. When people are not able to hear anything, or perhaps only a very few sounds, we say they are deaf.

10 Just like the process of the eyeball working with light, the process of hearing sounds is also quite wondrous!



← **Show image 8A-5: Inner ear detail**

Your inner ear is the seat of your hearing, but it has another important job to perform as well. Your balance is controlled by your inner ear. Nestled beside your cochlea are three curved tubes called the semicircular canals. These canals are filled with fluid and lined with tiny hairs, just like the cochlea. Whenever you move your head—turning around, lying down, or bending forward—fluid inside the semicircular canals causes the hair to bend. The bending of the canals' tiny hairs sends nerve signals to your brain to let it know where and how you are moving. Your brain then sends messages to your muscles to keep you steady, maintaining your balance. Have you ever whirled around so fast that you became dizzy and lost your balance? That's because the fluid in the canals kept moving for a few seconds even after you stopped.



← **Show image 8A-6: Ricardo**

It's almost time to stop for today, but first close your eyes and fold your hands in your laps. Let's sit very quietly and find out how many different sounds we can hear in the room.¹¹

11 [Allow students to share what they hear.]

Just for fun before I go, I'll leave you with another riddle:

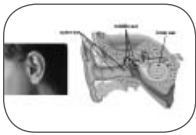
12 [Pause for students to answer.]

*I have ears, but cannot hear. What am I?*¹²

Comprehension Questions

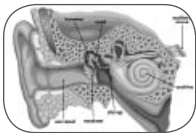
15 minutes

1. *Evaluative* Were your predictions correct about whether or not sound travels in a sequence, or order, through the ear parts, similar to how light travels through the eye? Why or why not? (Answers may vary.) List the order, or sequence of parts of the ear that sound travels through to allow you to hear. (Sound waves are collected in the outer ear, then channeled into the inner ear; next sound hits the ear drum; the hammer hits the anvil, the anvil hits the stirrup, and the cochlea ripples.)
2. *Inferential* Why do our ears produce earwax? (to prevent infections by keeping dirt and other particles from building up in the ear canal)
3. *Literal* What are the three sections of the human ear? (outer ear, middle ear, and inner ear)



← **Show image 8A-2: Ear up-close**

4. *Literal* What are the parts of the outer ear? (pinna, or earflaps, made of cartilage; earlobe (part of the pinna); ear canal; and eardrum) [Have students point to the parts of the outer ear on the image.]





← **Show image 8A-3: Human ear**

5. *Inferential* What are the three parts of the middle ear? (hammer, anvil, stirrup) [Have students point to the parts of the middle ear.] What is unique about these three parts? (They are the smallest bones in the human body.)





← **Show image 8A-5: Inner ear detail**

6. *Inferential* What is this snail-shaped part of the ear called? (cochlea) What is the purpose of the cochlea? (It contains hearing cells and helps you to hear.)

7.  *Evaluative* You have described the order in which the parts of the ear receive and process sound. Now, explain what happens to sound at each stop along the path of the ear parts, which allows a person to hear. (The outer ear collects sound waves and channels them into the ear canal where they hit the eardrum, causing it and the three bones in the middle ear to vibrate; the hammer hits the anvil, and the anvil hits the stirrup. The vibrations in the middle ear cause liquid in the inner ear to vibrate, creating waves in the fluid of the inner ear, and causing the tiny hairs of the cochlea to ripple. The sensory hair cells produce nerve impulses, which are carried along the auditory nerve to the hearing center of the brain. The brain recognizes the nerve impulses as sound.) **Why is it very important to take good care of the ears?** (Answers may vary, but should include the importance of ears for communicating and learning about our surroundings.)
8.  *Evaluative* Compare and contrast the ears with the eyes, using narrative sentences that describe something that happened this morning at breakfast or while you were getting ready for school. (Answers may vary.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

9.  *Evaluative* **Think Pair Share:** How does your sense of hearing help you on a daily basis? (Answers may vary.)
10. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?
-  You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Impulses

5 minutes

1. In the read-aloud you heard, “Next, the sensory hair cells bend and stretch, producing nerve *impulses*.”
2. Say the word *impulses* with me.
3. Impulses are the electrical signals carried through the nerves of the ear to the brain that enable someone to be able to hear sound.
4. The human brain is such a wondrous part of our body that it can interpret nerve impulses from the ear as sound!
5. We have talked about several types of nerve impulses throughout this domain. What are some of the nerve impulses we’ve talked about? Be sure to use the word *impulses* when you tell about it. [Ask two or three students. If necessary, remind them that in Lesson 5 they discussed the impulses that travel to and from the brain to enable them to use their five senses; they discussed the nervous system in Lesson 6; and they discussed the role of nerve impulses in the eyes in Lesson 7. If necessary, guide and/or rephrase the students’ responses to make complete sentences: “The nerve impulses . . .”]
6. What’s the word we’ve been talking about? What part of speech is the word *impulses*?

Use a *Discussion* activity for follow-up. Write the word *impulses* on a piece of chart paper, a chalkboard, or a whiteboard. Tell students that while they have been discussing one meaning of the word *impulses* today, there are other meanings of that word. Ask students, “What is the meaning of *impulses* as we have been using it in this domain?” Ask students if they know another meaning of that word or other way the word *impulses* can be used. Guide students to define *impulses* as sudden, strong desires to do something. When students have arrived at that definition of *impulses*, write that definition on the chart paper, chalkboard, or whiteboard. Ask students, “When is a time you had a sudden impulse to do something?” If necessary, guide and/or rephrase the students’ responses to make complete sentences: “I once had an impulse to . . .”



Complete Remainder of the Lesson Later in the Day



Hearing

The Parts of the Ear

8B

Extensions

20 minutes



Writing a Narrative: Draft/Revise (Instructional Masters 6B-1, 7B-1, 8B-1, and 8B-2)

Give students their copies of Instructional Masters 6B-1 and 7B-1. Remind students that they have completed the planning step of the writing process and that today they are going to continue working on the drafting step.

Have students reread their drafts. Ask them if the “hook” sentence draws the reader in. Tell students that they are going to use a Revision Checklist to help them know what other changes need to be made to the paragraph. Ask, “Who can tell me what *revise* means?” Remind students that the word *revise* means *change* and is a substep of the drafting step. Remind students that writers often revise many, many times before they are able to call their final manuscript “finished.” Remind students that revising is somewhat different from editing: revising often includes making changes to the content and/or the order of the content, whereas editing often includes making corrections to grammar, punctuation, and spelling according to the rules of standard English. Tell students that they will complete the edit step the next time you meet to work on writing.


Give each student a copy of Instructional Master 8B-1. You may also wish to copy Instructional Master 8B-1 onto chart paper, a chalkboard, or a whiteboard and read it aloud to students. Have students look at their drafts again and answer the questions on the Revision Checklist to see if there are any necessary content revisions to be made to their paragraphs.

Remind students that in the opinion paragraph they wrote together in *Classic Tales: The Wind in the Willows*, their supporting example sentences were in chronological order because they followed the plot of the story. Remind students that many narratives follow the plot in chronological order, but that sometimes a narrative begins in the present, then flashes back to the past, or moves forward into the future. You may wish to have students write their sentences onto strips and move them around to see which order helps the narrative flow best.

Once revisions have been decided upon, remind students that the last substep of the drafting step is to write a second draft of their paragraphs, incorporating the changes made during the revision substep. Give students a copy of Instructional Master 8B-2. As students rewrite their paragraphs, remind them to use capital letters at the beginning of their sentences, appropriate punctuation at the end, and quotation marks and commas with their dialogue.

Have students revisit their list of title ideas to see if one of them is a fitting choice. Tell students that they may wish to write a title at the top of their drafts, but that they may keep thinking about other title ideas. Tell students that they will complete the next step of the writing process, edit, the next time you meet to work on writing together, and that they may decide on a final title then.

Note: You may wish to model this step of the writing process for some students who are not ready to complete it independently. You may also wish to have students work with partners or in groups, especially when completing the Revisions Checklist. You may need to take more than one day to complete this step of the writing process, as the narrative is longer than other genres previously taught.

 You may wish to introduce or review the terms *flashback* and *foreshadowing* if students grasp the concepts of the basic narrative and are ready for this variety/challenge.



A Clean Bill of Health

9

✔ Lesson Objectives

Core Content Objectives

Students will:

- ✓ Briefly describe and/or review seven of the systems of the human body
- ✓ Explain that the human body is made up of the following systems and briefly identify the function of each: skeletal, muscular, nervous
- ✓ Identify cells as the basic building blocks of all living things and explain that most cells are too small to be seen without a microscope
- ✓ Explain the relationship between cells, tissues, organs, and systems
- ✓ Explain that each system is made up of different types of cells (bone cells, muscle cells, nerve cells, blood cells, etc.)
- ✓ Identify ways to take care of the human body

Language Arts Objectives

The following language arts objectives are addressed in this lesson. Objectives aligning with the Common Core State Standards are noted with the corresponding standard in parentheses. Refer to the Alignment Chart for additional standards addressed in all lessons in this domain.

Students will:

- ✓ Describe the relationship between the systems of the human body in *The Human Body: Systems and Senses* using language that pertains to sequence and cause/effect (RI.3.3)
- ✓ Determine the literal and nonliteral meanings of and appropriately use common sayings and phrases, such as “clean bill of health” as used in “A Clean Bill of Health” (RI.3.4) (L.3.5a)
- ✓ Interpret information from a KWL chart created in *The Human Body: Systems and Senses* (RI.3.7)
- ✓ Describe images and how they contribute to what is conveyed about the systems in the human body in “A Clean Bill of Health” (RI.3.7)

- ✓ Compare and contrast the nervous system in the human body to the system of electrical wiring in a house as discussed in “A Clean Bill of Health” (RI.3.9)
- ✓ Use a Character/Setting/Plot graphic organizer to aid in editing a narrative writing piece that establishes a situation and introduces a narrator and/or characters, and organizes an event sequence that unfolds naturally (W.3.3a)
- ✓ Identify and use parts of a paragraph, including a lead sentence, supporting details, and a concluding statement, in a narrative piece (W.3.3a)
- ✓ Continue development of a narrative writing piece that uses dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations (W.3.3b)
- ✓ Use temporal words and phrases to signal event order in a narrative piece (W.3.3c)
- ✓ Provide a sense of closure in a narrative piece (W.3.3d)
- ✓ With guidance and support from peers and adults, use the steps of the writing process such as plan, draft, revise, edit, and publish to create a narrative writing piece that will be developed and strengthened over an extended time frame (W.3.5) (W.3.10)
- ✓ With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others (W.3.6)*
- ✓ Categorize and organize statements and questions about the human body through engagement with the KWL chart used in *The Human Body: Systems and Senses* (W.3.8)

Core Vocabulary

Note: You may wish to display some of these vocabulary words in your classroom for students to reference throughout the domain. You may also choose to have students write some of these words in a “domain dictionary” notebook, along with definitions, sentences, and/or other writing exercises using these vocabulary words.

delicate, *adj.* Easily broken or damaged

Example: We handled my grandmother’s delicate lace tablecloth carefully so we would not damage it.

Variation(s): none

diet, n. The usual food and drink taken in by a living thing
Example: An elephant’s diet consists of approximately 350 pounds of trees and plants each day.

Variation(s): diets

miraculously, adv. Amazingly; incredibly
Example: Although the wind can blow at more than one hundred miles per hour at the top of Mt. Everest, many people have miraculously climbed that mountain.

Variation(s): none


posture, n. The way in which someone holds or carries his or her body
Example: Mrs. Daley tries to correct her son’s posture by reminding him to stand up straight and not slouch.

Variation(s): postures

wiring, n. A system or network of wires that carries electricity from one place to another

Example: Setting up the wiring of all of the office computers took several hours.

Variation(s): none

<i>At a Glance</i>	Exercise	Materials	Minutes
<i>Introducing the Read-Aloud</i>	What Have We Already Learned?	KWL Chart	10
	Sayings and Phrases: A Clean Bill of Health		
	Purpose for Listening		
<i>Presenting the Read-Aloud</i>	A Clean Bill of Health		20
<i>Discussing the Read-Aloud</i>	Comprehension Questions		15
	Word Work: Miraculously		5
 Complete Remainder of the Lesson Later in the Day			
<i>Extensions</i>	Systems Sort	Image Cards 16–27	20
	Writing a Narrative: Edit/Final Copy	Instructional Masters 6B-1, 8B-2, and 9B-1	
<i>Take-Home Material</i>	Family Letter	Instructional Master 9B-2	



A Clean Bill of Health

9_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

Tell students that today's read-aloud is the last one they will be hearing about the different human body systems, and that they have learned quite a bit of information about how the human body works. Revisit the KWL chart to review any important information about the skeletal, muscular, and nervous systems, including how they are interconnected with the circulatory, respiratory, digestive, and excretory systems. Ask students if they see any questions from the 'W' section that have remained unanswered. Share with students that they may have time to research any unanswered questions during the Pausing Point.

Sayings and Phrases: A Clean Bill of Health

An idiom is an expression whose meaning goes beyond the literal meaning of its individual words. Idioms have been passed down orally or quoted in literature and other printed text. Idioms often use figurative language, meaning that what is stated is not literally taking place. It is important to help your students understand the difference between the literal meanings of the words and their implied or figurative meanings.

Read students the title of today's read-aloud: "A Clean Bill of Health." Have students repeat the idiom after you. Ask students if they have ever heard this saying before. Ask students what they think the word *bill* means in this idiom. Explain that the way the word *bill* is used here is not like a bill their parents have to pay at a restaurant or for a doctor's visit. The way *bill* is used here means an official document or a certificate that is provided by a medical doctor. Ask students what health is and what it means to be healthy. Explain that having a clean bill of health means that a doctor has examined you and has told you that your body is working properly and that you are healthy.

Explain that about a hundred years ago, before a ship could leave its port and enter a new one in a different city, it had to have a clean bill of health—an actual certificate—saying that the place where the ship came from had no record of diseases. If the ship did not have the document saying it came from a port with a clean bill of health, it was not allowed to enter into the new port.

Tell students that in a more general sense, the phrase “a clean bill of health” can refer to anything that is free of any faults or defects. If you have an older computer, but it is free of computer viruses and still functions well, you can say that your computer has a clean bill of health.

Tell students they will be hearing this phrase throughout the read-aloud. Try to find other opportunities to use this idiom in the classroom.

Purpose for Listening

Tell students to listen carefully as they review information about the different human body systems.

Note: An adapted text copy of this read-aloud is included in the student workbook as Family Letter 9B-2.



A Clean Bill of Health

← Show image 9A-1: Ricardo and Dr. Welbody

Today is our last day together. Dr. Welbody is here to help us review some of what you learned about the human body. Take it away, Dr. Welbody!

Hello, everyone! It's so nice to see you again! When Ricardo and I talked last night, I said that I hoped that you had learned how to take care of your bodies so that your pediatricians could give you a "clean bill of health." Does anyone know what I mean by "a clean bill of health?"¹ It's just another way of saying that you're healthy. If someone examines you and finds nothing wrong, they will give you a clean bill of health. It's important to know how to keep your bodies healthy, so I will talk to you about that, too.

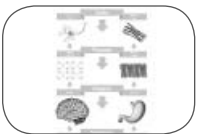
1 [Pause for students to answer.]



← Show image 9A-2: Mammals

Humans are mammals. What do you know about mammals?² All mammals are warm-blooded animals that grow body hair, produce milk for their young, and have brains and backbones. You have brains and backbones, so you are also vertebrates. All mammals are vertebrates, but are all mammals alike—cats and dogs, foxes and sheep, whales and seals? What makes you different from all of them? That's a question I'd like for you to think about as we review what you know about humans.

2 [Pause for students to answer.]



← Show image 9A-3: Cell, tissue, organ, and systems diagram

Humans have cells, tiny microscopic units that are the building blocks of their bodies.³ Similar cells group together to form tissues. Tissues form organs, and organs build systems. Remember that nerve cells become nerve tissue, which is what the organs in the nervous system are made of; whereas muscle cells become muscle tissue, which is what muscles are made of. All the systems working together form a complicated, interconnected network. Do other mammals have cells, tissues, organs, and systems?⁴ Yes, cells are the basic building blocks of all living things, including all other mammals—and plants, too!

3 [Point to each level as you read the following sentences.]

4 [Pause for students to answer.]



← Show image 9A-4: Human body systems

5 Remember, there are more systems in the human body than these seven, and you will learn about them in later grades.

Humans have many interconnected systems, including the circulatory system, the digestive system, the excretory system, the respiratory system, and the three that we talked about the most: the skeletal system, the muscular system, and the nervous system.⁵

Do all mammals have circulatory systems? Yes! Blood travels through mammals' bodies. Do they have digestive systems? Yes, they eat and break down food. Do they have excretory systems? Yes, they sweat and urinate! Do they have respiratory systems? Yes, mammals breathe in air. Do mammals have skeletal systems? Yes, they have backbones. Do they have muscular systems? Yes, mammals run and jump or glide and swim, moving those bones, so they must have muscles. And, do they have nervous systems? Yes, they react to their environments, so they must have nerves. Let's take a closer look at your skeletal system.



← Show image 9A-5: Bones in the skeletal system

6 Show me where your axial bones are located. What are your appendages?

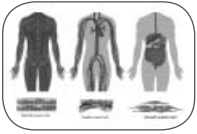
Your skeletal system is made up of axial bones and appendicular bones, working together to give your body a sturdy framework for all the other systems.⁶ Your vertebrae are stacked in a column, forming your spine. Together with your protective skull and rib cage, they are your axial bones, running down the center, or axis, of your body. Your legs and arms are attached to your appendicular bones, the shoulder blades and the pelvis.

7 [Pause for students to answer.]

Can anyone remember what we call the point where two bones meet?⁷ Yes, it's called a joint. Some joints move, others don't, and some move just a little bit. And what's the name of the connective tissues that wrap around your joints to hold your bones together?⁸ Yes, they're ligaments.

8 [Pause for students to answer.]

What can you do to give your skeletal system a clean bill of health? **Diet** is important. Make sure that you eat enough foods with calcium to grow strong bones. Milk, broccoli, and dark, leafy greens are good choices. **Posture** is important, too; make sure that you sit and stand up straight. Keep your back safe by bending your knees when you lift something heavy!



← **Show image 9A-6: Muscles in the muscular system**

Rope-like tissues called tendons attach your bones to muscles. These skeletal muscles give your bones mobility, allowing you to touch your toes or climb a mountain. Because we control our skeletal muscles, we call them voluntary muscles. There are other muscles that we cannot consciously control. What do we call them?⁹ Right! Involuntary muscles.

9 [Pause for students to answer.]

Smooth muscles are involuntary muscles. They contract and lengthen on their own, working day and night to complete their jobs. Who can give an example of a smooth muscle?¹⁰

10 [Answers may include muscles lining the organs of the digestive, respiratory, or circulatory systems.]

A third type of muscle is also involuntary. This is your body's most important type of muscle. It is the muscle that keeps you alive. Does anyone remember the name of the strong muscle that is found only in your heart?¹¹ Yes—it is called cardiac muscle.

11 [Pause for students to answer.]

It is important to keep all of your muscles, both voluntary and involuntary, healthy. What can you do to give your muscles a clean bill of health? Diet is important. Muscles need protein found in eggs, meat, beans, and nuts. Exercise strengthens your muscles. Get all the exercise you can as a way of thanking your muscles for keeping you in constant motion.



← **Show image 9A-7: Nerves in the nervous system**

Your nervous system is your body's command system, communicating with the rest of your body systems, telling them what to do. It works closely with your skeletal and muscular systems. Your skeletal muscles move your skeletal bones, but your muscles get their commands from messages sent by the nervous system. A network of nerves links your brain and spinal cord to muscles and sensory organs all over your body.

Nerves collect messages from your brain, from your senses, and from other places inside your body. Many messages can be sent at the same time, as electrical impulses dash around your body in split-second relays. Your nervous system, with your brain acting as its main commander, controls everything you do.

12 Wiring refers to the system of wires that controls something, like electricity. If wiring is shorted out, a working connection is no longer present.

13 It makes sense that because our systems are interconnected, they are affected by many of the same things, like diet and exercise.



14 People who do not have the benefit of particular sensory organs have many other ways to get information about the world around them. A deaf student may be able to understand a read-aloud if s/he knows how to read lips, that is, to watch the way a person's mouth moves when forming words. A blind student may read text by feeling Braille—raised dots on paper—and may imagine pictures in his or her mind while the teacher is reading aloud.

15 [Pause for students to answer.]

Your nervous system is like an electrical system. Electrical **wiring**—whether in your house or in your body—can be shorted out if something goes wrong.¹² So, how can you prevent that? How can you give your nervous system a clean bill of health? It's no surprise that diet and exercise are just as important to your nervous system as they are to your other systems.¹³ Vitamins and minerals from healthy foods like fresh fruits and vegetables, and protein from different foods, are all important. Drinking lots of water helps, too. Stay away from eating extra salty foods and from anything that is filled with too much sugar, such as soda. Apples and oranges are great substitutes. Be sure to get outside every day to play, and be sure to get plenty of sleep. Your bodies are working very hard as they grow, and they need plenty of nourishment—or food—and rest to grow on!

← **Show image 9A-8: The five senses and sensory organs**

All we have left to review are your sensory organs, which include parts of your eyes and ears. Without these sensory organs, you could not hear me reading aloud, and you would not be able to see the images I'm showing you.¹⁴ In order to see, you need light. Your eye sees objects by seeing the light that bounces off those objects. Light passes through the cornea, the outer covering of your eye. Light rays are bent by the cornea before they pass through the pupil, the black dot at the center of your eye, to the lens, and on to the retina at the back of your eye. A short optic nerve, attached to the eyeball, sends impulses to the brain, where the image is interpreted and you see it.

What can you do to give your eyes a clean bill of health?¹⁵ Your eyes already have some built-in protection: eyelids, eyebrows, and eyelashes keep dust and sweat away. Two deep sockets in your skull protect your eyeballs. But there are other things that you can do to prevent injury to your eyes. Never look directly at the sun. Avoid bright lights and smoky spaces. Give your eyes a rest, never sitting for too long in front of a computer or a television screen. Wear safety goggles to protect your eyes from damaging chemicals in pool water or chemicals in a science lab, and wear sunglasses to protect from the glare from sunlight shining off things such as polished surfaces or snow.

Your eyes and ears often work together to make sense of your world. Your ears include the outer ear, those flaps we see on the outside of your head, and two other sections: the middle ear and the inner ear, both hidden inside your head. Your outer ear catches sound waves from the air and directs them through your ear canal to your eardrum; the eardrum vibrates and begins to move the bones of the middle ear. The hammer, anvil, and stirrup set off vibrations in the inner ear, causing the tiny hairs of the cochlea, a snail-shaped bony tube, to move. These hair cells produce nerve impulses, sending them along your auditory nerve to your brain. Your brain sorts everything out and you **miraculously** hear sound.

Your ears are **delicate** organs as well, so how can you give them a clean bill of health? Most important, keep the noise volume down. Ears can be damaged when sounds are too loud. Although it is important to keep your ears clean, you must never stick anything in them. Objects might get stuck or otherwise cause damage to the eardrum.



← **Show image 9A-9: Ricardo and Dr. Welbody**

Well, that brings us to the end of our time together. We've had lots of fun, and I hope you have, too. We hope you've also learned a few things along the way. Here is one last riddle before we leave you:






*I am probably the most important three pounds in your body. I help you think and reason. I control your movements, as well as all your senses. I am the one organ that makes humans more advanced than other mammals. What am I?*¹⁶


16 [Pause for students to answer.]

Remember to eat a balanced diet and exercise every day. Dr. Welbody and I wish you all a clean bill of health at your next check-up! Bye for now!


Comprehension Questions

15 minutes


1.  *Inferential* What are some things you can do to give your body a clean bill of health? (eat a healthy, balanced diet and find time to exercise every day)
2. *Inferential* What are some facts you've learned about the skeletal system? (Answers may vary.) Why is posture important for the skeletal system? (It helps keep the spinal column in good shape.)
3. *Inferential* What are some facts you've learned about the muscular system? (Answers may vary.) What are some examples of voluntary and involuntary muscles? (Answers may vary, but could include the calf muscle as a voluntary muscle, the cardiac muscle as an involuntary muscle, etc.)
4. *Inferential* What are some facts you've learned about your nervous system? (Answers may vary.)
5.  *Evaluative* Compare the nervous system to the electrical wiring of a house. (Just like electricity runs through the entire house, the nervous system's electrical signals run through the entire interconnected structure of the body, sending messages and helping your body function.)
6.  *Inferential* Explain why cells are called the building blocks of life. (Cells are tiny structures that group together to form larger structures, such as tissues and organs.)
7.  *Inferential* Describe the different types of cells and what they form. (Nerve cells form nerve tissue, which makes up the organs in the nervous system, and muscle cells form muscle tissue, which makes up the muscles.)
8. *Inferential* What have you learned about how the eyes and ears work? (Answers may vary.) What are some ways to give your delicate eyes and ears a clean bill of health? (eyes: wearing sunglasses and protective goggles, resting your eyes from computer and TV screens, etc.; ears: not listening to music too loud, not sticking anything in them, keeping them clean, etc.)
9.  *Evaluative* How would your life be different without your sensory organs? (Answers may vary.)

10.  *Evaluative* What do you think makes humans different from other mammals? (Answer may vary.)

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

11.  *Evaluative Think Pair Share:* What do you think is the most fascinating human body system? Why? (Answers may vary.)

12. After hearing today's read-aloud and comprehension questions and answers, do you have any remaining questions?

 You may wish to allow time for individual, group, or class research of the text and/or other resources to answer any remaining questions.

Word Work: Miraculously

5 minutes

1. In the read-aloud you heard that when sound enters your ear, your brain sorts everything out and you *miraculously* hear sound.
2. Say the word *miraculously* with me.
3. When something happens miraculously, it is so amazing that it's almost as if it's happening by a miracle or is in fact a miracle.
4. Isn't it amazing that the sun miraculously rises every morning?
5. What are some things that you think happen miraculously? Be sure to use the word *miraculously* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students' responses to make complete sentences: "_____ miraculously happened because . . ."]
6. What's the word we've been talking about? What part of speech is the word *miraculously*?

Use a *Discussion* activity for follow-up. Ask students, "What are other things that your body does miraculously?" Make sure that students use the word *miraculously* and other domain-related vocabulary in complete sentences in their discussion.



Complete Remainder of the Lesson Later in the Day



A Clean Bill of Health

9_B

Extensions

20 minutes

Note: An additional thirty minutes added to the Extension time starts at this point in the domain. Please refer to the schedule in the introduction to guide you for these remaining five days.

Systems Sort

Note: You may wish to conduct this exercise as a class, or by having students form small groups, giving each group a handful of image cards to discuss.

Using Image Cards 16–27, ask a student to choose an image card and show it to the other students. The student must then describe the various systems working to complete the actions taking place in the picture s/he is holding. For example, for the image of the people rollerblading, a student may say, “The interconnected muscular, skeletal, respiratory, and nervous systems are working together to help the people in the image to rollerblade.” You may also choose to emphasize the part of the brain responsible for balance and coordination—the cerebellum. Have a student proceed to another card and identify the different systems being used. If the student volunteer does not name all possible responses, encourage other students to fill in any systems they think are in action as well. Emphasize that all the systems are interconnected, and reinforce domain vocabulary whenever possible.



Writing a Narrative: Edit/Final Copy (Instructional Masters 6B-1, 8B-2, and 9B-1)

Give students their copies of Instructional Masters 6B-1 and 8B-2. Remind students that they have completed the planning and drafting steps of the writing process and that today they are going to complete the editing step. Tell students that this is also the time to decide on a final title.

Tell students that they are going to use an Editing Checklist to help them know if any further corrections are needed. Explain that writers often edit their drafts many, many times before they are able to call their final manuscripts “finished.” Remind students that editing is different from

revising: revising often includes making changes to the content and/or order of content, whereas editing is making corrections to grammar, punctuation, and spelling according to the rules of standard English.

Give each student a copy of Instructional Master 9B-1. You may also wish to copy Instructional Master 9B-1 onto chart paper, a chalkboard, or a whiteboard and read it aloud to students. Have students read their drafts and answer the questions on the Editing Checklist to know if they need to make any edits to their grammar, punctuation, or spelling.

Tell students that after editing and deciding on a title, the last substep before publishing their narratives is to create a final copy. You may wish to have students type this final copy to reinforce keyboarding skills, including spell-check and dictionary and thesaurus functions.

Tell students that they have now completed the editing step, including the substep of creating the final copy, and that they will complete the publishing step the next time you meet to work on writing. Explain that this means they are going to create a presentation of their final copies, possibly together with illustrations and/or other graphic aids, to display and share with others. Encourage students to be thinking of any illustrations they would like to include with their narratives during the publishing step.

Note: You may wish to model this step of the writing process for some students who are not ready to complete it independently. You may also wish to have some students work with partners or in groups. You may need to take more than one day to complete this step of the writing process, as the narrative is longer than other genres previously taught.

The publishing step of this narrative piece has been placed at the beginning of Pausing Point 2. It is highly recommended that you regard this part of Pausing Point 2 as *required* in order to most accurately align with the writing requirements of the Common Core State Standards.

Take-Home Material

Family Letter

Send home Instructional Master 9B-2. Encourage families to read this adapted text copy of the read-aloud with their children to review the content of this domain.



Pausing Point 2

PP₂

Note to Teacher

This is the end of the read-alouds for *The Human Body: Systems and Senses* domain. Students have studied the systems and senses of the human body, including the muscular, skeletal, nervous, digestive, circulatory, respiratory, and excretory systems. They have also learned about the parts of the eye and the ear, and how those parts function together to help us see and hear. Students have learned about how to care for the different body systems through a well-balanced diet and exercise. It is highly recommended that you pause here and spend two days reviewing, reinforcing, or extending the material taught thus far.

You may have students do any combination of the activities listed below. The activities may be done in any order. You may wish to do one activity on successive days. You may also choose to do an activity with the whole class or with a small group of students who would benefit from the particular activity.

Core Content Addressed in This Domain

Students will:

- ✓ Briefly describe and/or review seven of the systems of the human body
- ✓ Explain that the human body includes the following systems and identify the function of each: skeletal, muscular, and nervous
- ✓ Identify cells as the basic building blocks of all living things and explain that most cells are too small to be seen without a microscope
- ✓ Explain the relationship between cells, tissues, organs, and systems
- ✓ Explain that each system is made up of different types of cells (bone cells, muscle cells, nerve cells, blood cells, etc.)
- ✓ Explain that one of the systems of the human body is the skeletal system and that it has two parts
- ✓ Recall that there are 206 bones in the human body
- ✓ Explain briefly the composition of bones

- ✓ Identify examples of axial bones and explain their functions
- ✓ Identify examples of appendicular bones and explain their functions
- ✓ Identify three different types of joints and give examples of each: movable, immovable, and partially movable
- ✓ Describe how doctors are able to see and treat the skeletal system using an x-ray
- ✓ Explain the importance and purpose of cartilage
- ✓ Identify skeletal, smooth, and cardiac as three types of muscles in the human body and describe their functions
- ✓ Compare and contrast involuntary and voluntary muscles
- ✓ Explain that skeletal muscles work closely with bones to give the human body mobility
- ✓ Demonstrate familiarity with the legend of the Achilles heel/tendon
- ✓ Identify the brain and spinal cord as the control center of the body
- ✓ Identify nerves as messengers that transmit information from all of the parts of the body through the spinal cord to the brain
- ✓ Explain how the skeletal, muscular, and nervous systems are interconnected
- ✓ Explain that the five senses work with the brain to process information about our surroundings
- ✓ Describe a reflex action as a quick, unconscious action and explain its purpose in protecting the human body
- ✓ Identify the parts of the brain and their functions: brain stem (medulla), cerebrum, cerebellum
- ✓ Describe the human brain as divided into two hemispheres and explain that each hemisphere controls the muscles of the opposite side of the body
- ✓ Identify the parts of the outer and inner eye and describe how they work together with the brain to allow a person to see
- ✓ Describe nearsightedness and farsightedness and how these can be corrected
- ✓ Identify the parts of the outer, middle, and inner ear and describe how they work together with the brain to allow a person to hear

- ✓ Explain that cochlear implants can help some people who cannot hear
- ✓ Identify ways to take care of the human body

Activities

Writing a Narrative: Publish (Instructional Masters 8B-2 and PP2-1)

Give each student a copy of Instructional Masters 8B-2 and PP2-1. Remind them that they have completed the editing step of the writing process for their narratives, including the substep of creating the final copy. Tell students that they will now complete the publishing step of the writing process. Explain that this means they will create a presentation of their narratives to share.

Remind students that they completed the publishing step together in previous domains. Remind students that there are many ways to publish their writing. For example, some students may wish to use technology to add computer graphics such as illustrations, text boxes, and sidebars to aid in the presentation of information. Some students may wish to create a PowerPoint presentation. Other students may wish to create an artistic “book” format of their narratives—as excerpts or as a whole—perhaps with handwritten text and/or handmade illustrations.

Encourage students to be creative. You may wish to have students share their published narratives with the class, school, and/or community. You may also wish to use Instructional Master [PP2-3] to assess students’ formal writing.

Note: You may wish to model this step of the writing process for some students who are not ready to complete it independently. You may also wish to have some students work with partners or in groups. You may need to take more than one day to complete this step of the writing process, as the narrative is longer than other genres previously taught.

10 The Human Eye

Materials: Instructional Master PP2-2

As a class, complete a brief image review. Flip through the images from the read-aloud, “Vision: The Parts of the Eye,” focusing on the images that discuss the parts of the eye. Give students Instructional Master PP2-

2. Have students label the parts of the human eye. You may wish to have students complete this instructional master independently, with a partner, or as a group.

Note: This exercise is essential preparation for the Domain Assessment. It is highly recommended that students practice labeling the parts of the eye independently or with a partner during this Pausing Point.

The Human Ear

Materials: Instructional Master PP2-3

Complete a brief image review. Flip through the images from the read-aloud, “Hearing: The Parts of the Ear,” focusing on the images that discuss the parts of the ears. Give students Instructional Master PP2-3. Have students label the parts of the human ear. You may wish to have students complete this instructional master independently, with a partner, or as a group.

Note: This exercise is essential preparation for the Domain Assessment. It is highly recommended that students practice labeling the parts of the ear independently or with a partner during this Pausing Point.

Image Review

Show the images from any read-aloud again, and have students retell the read-aloud using the images. Encourage students to use domain-related vocabulary.

Image Card Review: System Sort

Materials: Image Cards 16–27

In your hand, hold Image Cards 16–27 fanned out like a deck of cards. Ask a student to choose a card and show it to the class. The student must then describe the various systems working to complete the actions taking place in the picture s/he is holding. For example, for the image of the swimmer, a student may say the muscular, skeletal, respiratory, and nervous systems are working together to help the person in the image to swim. Proceed to another card and identify the different systems being used. If the student volunteer does not name all possible responses, encourage the rest of the class to fill in any systems they think are in action. Emphasize that all the systems are interconnected, and reinforce domain vocabulary whenever possible.



Domain-Related Trade Book or Student Choice

Materials: Trade book

Read an additional trade book to review the human body's systems or how to stay healthy. Refer to the books listed in the domain introduction. You may also choose to have the students select a read-aloud to be heard again.

If students listen to a read-aloud a second time, you may wish to have them take notes about a particular topic. Be sure to guide them in this important method of gathering information. You may wish to model how to take notes, construct an outline, etc.

Key Vocabulary Brainstorming

Materials: Chart paper, chalkboard, or whiteboard

Give students a key domain concept or vocabulary word such as *eyeball*. Have them brainstorm everything that comes to mind when they hear the word, such as *iris, pupil, cornea, optometrist*, etc. Record their responses on a piece of chart paper, a chalkboard, or a whiteboard for reference.



Multiple Meaning Word Activity: Pupil

Materials: chart paper, chalkboard, or whiteboard

Use a *Multiple Choice* activity to review the word *pupil*.

1. In Lesson 7, you heard “At the center of the iris is a black circle . . . called the pupil.” Here, a *pupil* is a small, black opening in the center of the colored part of the eye. [On chart paper, a chalkboard, or whiteboard, write “A—eye part.” Tell students this is definition A.]
2. The word *pupil* can also mean a child or young student in school. We sometimes refer to students as pupils. [Write “B—young student.”] Tell students this is definition B.
3. The word *pupil* might also refer to one who has been taught by a famous or important person, as in this sentence: “Fredrik Hasselquist was a pupil of the father of taxonomy, Carolus Linnaeus.” [Write “C—taught by important person.”] Tell students this is definition C.

Now have students form partners to quiz each other on the different meanings of the word *pupil*. Remember to be as descriptive as possible and use complete sentences. For example, you could say, “After my brother’s visit with the eye doctor, his pupils were so large that they

looked like cat eyes.” And your partner should respond, “That’s the ‘A’ definition of *pupil*—eye part.”

10 Riddles for Core Content

Ask students riddles such as the following to review core content:

- I am a small tunnel in your ear. You can find wax inside of me. What am I? (ear canal)
- We are the three smallest bones in the human body and are located in the middle ear. What are we? (hammer, anvil, and stirrup)
- I am the largest part of your brain, controlling and managing language, memory, thought, sensations, and decision-making. What am I? (cerebrum)
- I am about as thick as your thumb, and am three inches long. I help relay messages between your brain and spinal cord. What am I? (brain stem)
- I can become larger and smaller, depending on the amount of light. What am I? (pupil)
- I am rubbery, flexible, and transparent. I adjust shape in order to focus on near or distant objects. What am I? (the eye lens)

You may also wish to review Ricardo’s riddles from the read-alouds to review content.

 Have students create their own riddles.

Class Book: *The Human Body: Systems and Senses*


Materials: Drawing paper, drawing tools

Tell the class or a group of students that they are going to finish their class book to help them remember what they have learned in this domain about human body systems. Have students brainstorm important information about the human body’s systems, as well as information about the eye and the ear. They should also think about how they can keep their bodies healthy through diet and exercise. Have each student choose one idea to draw a picture of, and ask him or her to write a caption for the picture. Bind the pages to make a book to put in the class library for students to read again and again.

Writing Prompts

Students may be given an additional writing prompt such as one of the following:

- The most interesting thing I've learned is _____, because . . .
- One way I can keep my body healthy is . . .
- Something I would like to learn more about is _____ because . . .
- Without my brain, I could not . . .

 I would compare and contrast the skeletal, muscular, and nervous systems by. . .

Brain Action

Review that the brain is divided into two hemispheres. Review which hemisphere controls each side of the body. If time allows, review the different parts of the brain (brain stem, cerebrum, cerebral cortex, cerebellum). Have students try to write or draw with the hand they are unaccustomed to writing/drawing with. Perhaps carry this activity into outdoor time, having students take note of which leg they normally kick a ball with, which hand they normally throw with, and encouraging them to switch hands. What are the results? Reinforce domain-related vocabulary throughout the activity.

Guest Presenter

Invite the physical education teacher or school nutritionist to come to the class and read a book or give a presentation on how students can keep their bodies healthy. Parents or guardians who work in the exercise and nutrition industries (trainers, physical therapists, dieticians, etc.) would also be good sources.

Song: "Dry Bones"

Find a recording of the song "Dry Bones." Have students listen to the song once or twice, and encourage them to point to the various body parts mentioned in the song. After listening to the song, have students discuss the more technical names for the bones they learned about in the read-alouds, i.e., the "head bone" as the skull or cranium; the "back bone" and "neck bone" as the spine or spinal column; the "thigh bone" as the femur; the "knee bone" as a hinge joint; etc.

Ask students, “The skull and spine are both called what types of bones?” (axial bones) Ask, “What is another name for the bones in the legs and arms that hang off of the axial skeleton?” (appendicular bones) Reinforce how the different body parts mentioned in the song are interconnected. Explain that the bones inside our bodies are not actually dry. Ask students why they think that is.

Note: If your school has a music teacher, you may want to collaborate with him/her to teach this song to your students.

Research Activity: Taking Care of the Human Body

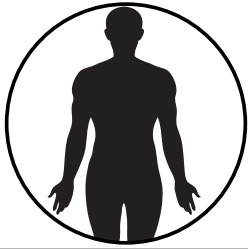
Materials: Trade books; computer with Internet access

Give students the opportunity to research how they can take care of their bodies. They may research what a well-balanced diet should consist of, and the types of exercises they can do on their own. Allow students the time to share their findings within a group or to the class. Refer to the recommended resources in the introduction.

Sources of Sound

Materials: Blindfold; bell

Have students use their sense of hearing to guess from which direction a sound is coming. Invite students to stand in a circle. Blindfold one student and place him or her in the center of the circle. Have one student in the circle speak. Ask the blindfolded student to guess which classmate spoke and where the student is standing. For a variation, you might have a student ring a bell or clap. Have the blindfolded student describe the sound that is being made and try to guess what is making the sound. Explain to students that they are hearing sound waves that travel through the air and reach their ears.



Domain Assessment

DA

This domain assessment evaluates each student's retention of the core content targeted in *The Human Body: Systems and Senses*.

10 Domain Assessment

Note: You may wish to have some students do the three parts of this assessment in two or three sittings. Some students may need help reading the questions. You may wish to allow some students to respond orally.

Part I (Instructional Master DA-1)

Directions: Listen to the sentence I read. Read the three words in the row. Circle the name of the person, place, or thing described in the sentence.

1. _____ are the building blocks of all life, and most are too small to be seen without a microscope. (cells)
2. Doctors may use an _____ to see the skeletal system and treat problems. (x-ray)
3. Cartilage covers bones where they meet at the _____, helping to protect them. (joints)
4. The most powerful tendon in the body about which a legend has been told is also known as the _____. (Achilles heel)
5. When you quickly move your hand away from something you are touching that is really hot, this reaction is called a _____. (reflex)
6. Which is NOT part of the control center of the body: brain, spinal cord, or eyeball? (eyeball)
7. The five _____ work with the brain to process information about our surroundings. (senses)
8. The _____ are messengers that transmit information from all of the body parts through the spinal cord to the brain. (nerves)
9. The brain is divided into _____ hemispheres. (two)
10. Which of these cannot be corrected with glasses or contact lenses: farsightedness, nearsightedness, or deafness? (deafness)

Part II (Instructional Master DA-2A)

Directions: Match the names of the parts of the eye with the definition.

Part III (Instructional Master DA-2B)

Directions: Label the diagram of the human ear using the words in the box.

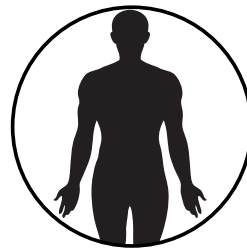
Part IV (Instructional Master DA-3)

Note: You may wish to have some students write more sentences or have some students focus only on responding to one or two statements.

Directions: Read along as I read each sentence. Write two or three complete sentences to respond to each statement.

1. Name the three types of joints and give one example of each.
2. Pick one of the following systems and assess how it helps you on a daily basis: skeletal, muscular, nervous.
3. Describe three ways you can help maintain a clean bill of health.

For Teacher Reference Only:
Copies of Tell It Again! Workbook



Name: _____

KWL Chart: Human Body Systems

Skeletal System

K	W	L

Directions: Write words and phrases and/or draw pictures of the different human body systems and senses.

KWL Chart: Human Body Systems

Muscular System

K	W	L

Name: _____

KWL Chart: Human Body Systems

Nervous System

K	W	L

KWL Chart: Human Body Systems

Eyes

K

W

L

Name: _____

KWL Chart: Human Body Systems

Ears

K	W	L



Dear Family Members,

During the next several weeks, your child will be learning about the human body. The focus will be on three important systems in the body, the skeletal, muscular, and nervous systems—in addition to the senses of sight and hearing. S/he will begin with a brief review of seven important, interconnected systems: the skeletal, muscular, nervous, digestive, excretory, circulatory, and respiratory systems. S/he will then learn in greater depth about the function of the skeletal system, the difference between axial and appendicular bones, the different types of muscles, and the way in which the central nervous system controls these interconnected systems.

Below are some suggestions for activities that you may do at home to reinforce what your child is learning about the human body.

1. Draw and Write

Have your child draw and write what s/he is learning about the human body and its interconnected systems, such as the way in which the muscular system is connected to the skeletal system. Your child will learn that the skeletal system provides the structure, or framework, for the body, while the muscular system enables the bones in the skeletal system to move. Ask your child to draw a picture of the way in which the skeletal system provides protection for the central nervous system, such as the way the skull serves as a helmet-like structure that protects the brain. Ask questions to help your child use the vocabulary s/he is learning at school.

2. A Song and a Game: “Dry Bones” and Simon Says

Review the parts of the human body by singing the song “Dry Bones” and by playing the game Simon Says. If you are not familiar with the song “Dry Bones,” try to find a recording and the lyrics online to share with your child. Ask questions to help your child tell you the more technical names for the bones and muscles that s/he has been learning at school (i.e., the “head bone” as the skull or cranium; the “back bone” and “neck bone” as the spine or spinal column; the “thigh bone” as the femur; the “knee bone” as a hinge joint; etc.). For the game Simon Says, have your child locate bones, examples of muscles, and examples of joints s/he has learned in class, such as the following: tibia, femur, fibula, clavicles, shoulder blades, cranium/skull, rib cage, spinal column, Achilles tendon, funny bone, voluntary muscles, involuntary muscles, movable joints, partially movable joints, immovable joints, etc.

3. Muscles

Your child will be learning about different types of muscles and the way in which muscles work. Ask your child to explain how muscles work in pairs to control movement of the skeletal system; when one muscle of the pair contracts, or gets shorter, the other muscle in the pair relaxes, or gets longer. Your child will learn about both voluntary muscles (such as the biceps and triceps in the arm) and involuntary muscles (such as the heart and the muscles of the digestive system). Ask your child to describe the difference between these two types of muscles and to give an example of each.

4. Words to Use

Below is a list of some of the words that your child will be learning about and using. Try to use these words as they come up in everyday speech with your child.

- *interconnected*—The systems of the human body are interconnected, so if one system develops a problem, it will often cause a problem with another system.
- *structure*—The skeletal system provides the body with its structure, just like the frame of a house provides the building with its structure.
- *appendages*—Appendages are things that are attached to, or are a part of, a larger, more central thing, such as an arm or leg attached to a torso.
- *vulnerable*—Athletes who play contact sports without helmets leave their heads vulnerable to serious injury.
- *consciously/unconsciously*—I was so consciously focused on listening carefully to the teacher, that I unconsciously dropped my pencil.

5. Read Aloud Each Day

It is very important that you read with your child every day. Set aside time to read to your child and also time to listen to your child read to you. I have attached a list of recommended trade books related to the human body and its interconnected systems that may be found at the library, as well as a list of informative websites.

Be sure to praise your child whenever s/he shares what has been learned at school.

Name: _____

Take-Home
Worksheet

Recommended Resources for The Human Body: Systems and Senses

Trade Book List

General Human Body Books

1. *Cells, Tissues, and Organs*, by Richard Spilsbury (Heinemann Library, 2008) ISBN 9781442037045
2. *The Human Body (A Magic Skeleton Book)*, by Janet Sacks (Sterling Publishing, 2002) ISBN 1402712146
3. *My Organ Buddies*, by Lee Downing and Felice Downing (Organ Buddies, Inc., 2010) ISBN 9780615329406
4. *Ultra-Organized Cell Systems*, by Rebecca L. Johnson (Millbrook Press, 2008) ISBN 9780822571384
5. *Watch Me Grow: Fun Ways to Learn About Cells, Bones, Muscles, and Joints*, by Michelle O'Brien-Palmer (Chicago Review Press, 1999) ISBN 155652367X
6. *Your Body Battles a Skinned Knee*, by Vicki Cobb, Dennis Kunkel, and Andrew N. Harris (Lerner Publishing Group, Inc., 2009) ISBN 9780822568148

The Skeletal System

7. *Bones: Our Skeletal System*, by Seymour Simon (HarperTrophy, 1998) ISBN 0688177212
8. *Bones and Muscles (Your Body Inside and Out)*, by Angela Royston (Sea-to-Sea Publications, 2012) ISBN 9781597712637
9. *The Skeletal System (Early Bird Body Systems)*, by Caroline Arnold (Lerner Publications Company, 2006) ISBN 0822525231
10. *The Skeletal System*, by Kay Manolis (Children's Press, 2009) ISBN 1600142478
11. *Your Body Battles a Broken Bone*, by Vicki Cobb, Dennis Kunkel, and Andrew N. Harris (Lerner Publishing Group, Inc., 2009) ISBN 9781580138345

The Muscular System

12. *Muscles: Our Muscular System*, by Seymour Simon (HarperTrophy, 1998) ISBN 0688177204
13. *Muscles: Our Muscular System*, by Seymour Simon (Scholastic Inc., 1999) ISBN 0439078075
14. *The Muscular System (Early Bird Body Systems)*, by Rebecca L. Johnson (Lerner Publications Company, 2006) ISBN 0822525208
15. *The Muscular System*, by Kay Manolis (Children's Press, 2009) ISBN 0531217035

The Skeletal-Muscular System

16. *The Mighty Muscular and Skeletal Systems*, by John Burstein (Crabtree Publishing Company, 2009) ISBN 0778744337
17. *What Happens When You Move?*, by Jacqui Bailey (The Rosen Publishing Group, 2009) ISBN 9781435826175

The Nervous System

18. *The Astounding Nervous System*, by John Burstein (Crabtree Publishing Company, 2009)
19. *The Brain*, by Seymour Simon (Collins, 2006) ISBN 9780060877194
20. *The Nervous System*, by Kay Manolis (Children's Press, 2009) ISBN 1600412451
21. *The Nervous System (Early Bird Body Systems)*, by Joelle Riley (Lerner Publications Company, 2006) ISBN 0822525216

22. *The Nervous System*, by Christine Taylor-Butler (Children's Press, 2008) ISBN 0531207358
23. *Touch (A True Book)*, by Patricia J. Murphy (Children's Press, 2003) ISBN 0516269720
24. *Your Brain*, by Terri DeGezelle (Capstone Press, 2002) ISBN 073683351X

Other Human Body Systems

25. *The Amazing Circulatory System*, by John Burstein (Crabtree Publishing Company, 2009) ISBN 9780778744313
26. *The Circulatory System*, by Kristin Petrie (ABDO Publishing Company, 2007) ISBN 9781596797093
27. *The Digestive System*, by Christine Taylor-Butler (Scholastic, Inc., 2008) ISBN 0531207315
28. *The Digestive System*, by Kirstin Petrie MS, RD (ABDO Publishing Company, 2007) ISBN 159679710X
29. *The Digestive System (Early Bird Body Systems)*, by Rebecca L. Johnson (Lerner Publications Company, 2005) ISBN 0822512475
30. *The Dynamic Digestive System: How Does My Stomach Work?*, by John Burnstein (Crabtree Publishing Company, 2009) ISBN 9780778744290
31. *Food and Digestion*, by Andrew Solway (Sea-to-Sea Publications, 2012) ISBN 9781597712644
32. *Gurgles and Growls: Learning About Your Stomach*, by Pamela Hill Nettleton (Picture Window Books, 2004) ISBN 9781404805040
33. *Guts: Our Digestive System*, by Seymour Simon (HarperCollins Publishers, 2005) ISBN 0060546514
34. *The Heart: Our Circulatory System*, by Seymour Simon (Collins, 2006) ISBN 0060877219
35. *The Heart and Circulation*, by Carol Ballard (Arcturus Publishing, 2005) ISBN 0749659645
36. *Lungs: Your Respiratory System*, by Seymour Simon (Collins, 2007) ISBN 0060546549
37. *The Quest to Digest*, by Mary K. Corcoran (Charlesbridge, 2006) ISBN 1570916640
38. *The Remarkable Respiratory System*, by John Burstein (Crabtree Publishing Company, 2009) ISBN 9780778744306
39. *The Respiratory System*, by Susan Glass (Perfection Learning Corporation, 2004) ISBN 0756944600
40. *The Respiratory System*, by Kristin Petrie (ABDO Publishing, 2007) ISBN 9781596797130
41. *The Respiratory System (A True Book)*, by Darlene Stille (Children's Press, 1997) ISBN 0516262769
42. *Smoking*, by Dr. Alvin Silverstein, Virginia Silverstein, and Laura Silverstein Nunn (Franklin Watts, 2003) ISBN 0531162397
43. *Squirt*, by Trudee Romanek (Kids Can Press, 2006) ISBN 9781553377771
44. *What Happens to a Hamburger?*, by Paul Showers (HarperCollins Publishers, 2001) ISBN 0064451836
45. *Where Does Your Food Go?*, by Wiley Blevins (Scholastic, Inc., 2003) ISBN 0516258605

Name: _____

Take-Home
Worksheet**Vision and Hearing**

46. *Eyes and Ears*, by Seymour Simon (HarperCollins Publishers, 1998) ISBN 0060733020
47. *Hearing (A True Book)*, by Patricia J. Murphy (Children's Press, 2003) ISBN 0516269704
48. *How Sight Works*, by Sally Morgan (The Rosen Publishing Group, 2010) ISBN 9781615325535
49. *Now Hear This!*, by Melissa Stewart (Marshall Cavendish Corporation, 2010) ISBN 9780761441618
50. *The Sense of Hearing*, by Elaine Landau (Children's Press, 2009) 0531218325
51. *The Sense of Sight (The Senses)*, by Mari Schuh (Bellwether Media, 2008) ISBN 1600140718
52. *The Sense of Sight*, by Ellen Weiss (Children's Press, 2009) ISBN 0531218333
53. *Sight (A True Book)*, by Patricia J. Murphy (Children's Press, 2003) ISBN 0516269682
54. *What Is Hearing?*, by Jennifer Boothroyd (Lerner Publishing Group, Inc., 2010) 9780761350149
55. *What Is Sight?*, by Jennifer Boothroyd (Lerner Publishing Group, Inc., 2010) 9780761350156
56. *Why Do We See Rainbows?*, by Melissa Stewart (Marshall Cavendish Corporation, 2009) ISBN 9780761429197

Taking Care of Your Body

57. *Eat Healthy, Feel Great*, by William Sears, M.D., Martha Sears, R.N., and Christie Watts Kelly (Little, Brown and Company, 2002) ISBN 0316787086
58. *Eating Well (Looking After Me)*, by Liz Gogerly and Mike Gordon (Crabtree Publishing Company, 2009) ISBN 0778741176
59. *The Edible Pyramid: Good Eating Every Day*, by Loreen Leedy (Holiday House, 1994) ISBN 9780823420742
60. *Good Enough to Eat: A Kid's Guide to Food and Nutrition*, by Lizzy Rockwell (HarperCollins Publishers, 1999) ISBN 0064451747
61. *Healthy Eating*, by Claire Llewellyn (QEB Publishing, 2006) ISBN 1595661920
62. *Healthy Eating (Science Everywhere!)*, by Helen Orme (New Forest Press, 2010) ISBN 1848982895
63. *How to Stay Healthy (I Know That!)*, by Claire Llewellyn (Sea-to-Sea Publishing, 2007) ISBN 1597710244
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<http://sciencenetlinks.com/media/filer/2011/10/13/allsystems.swf>
4. A Ride Through the Human Body
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Skeletal and Muscular System

5. How Does Your Body Move?
<http://www.bonesandharry.co.uk/main/main.html>

Nervous System and the Brain

6. Your Brain and the Nervous System
<http://kidshealth.org/kid/htbw/brain.html>
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<http://pbskids.org/zoom/activities/sci/reactiontime.html>
8. Sensitivity Tester Experiment
<http://pbskids.org/zoom/activities/sci/sensitivitytester.html>

Sense of Sight

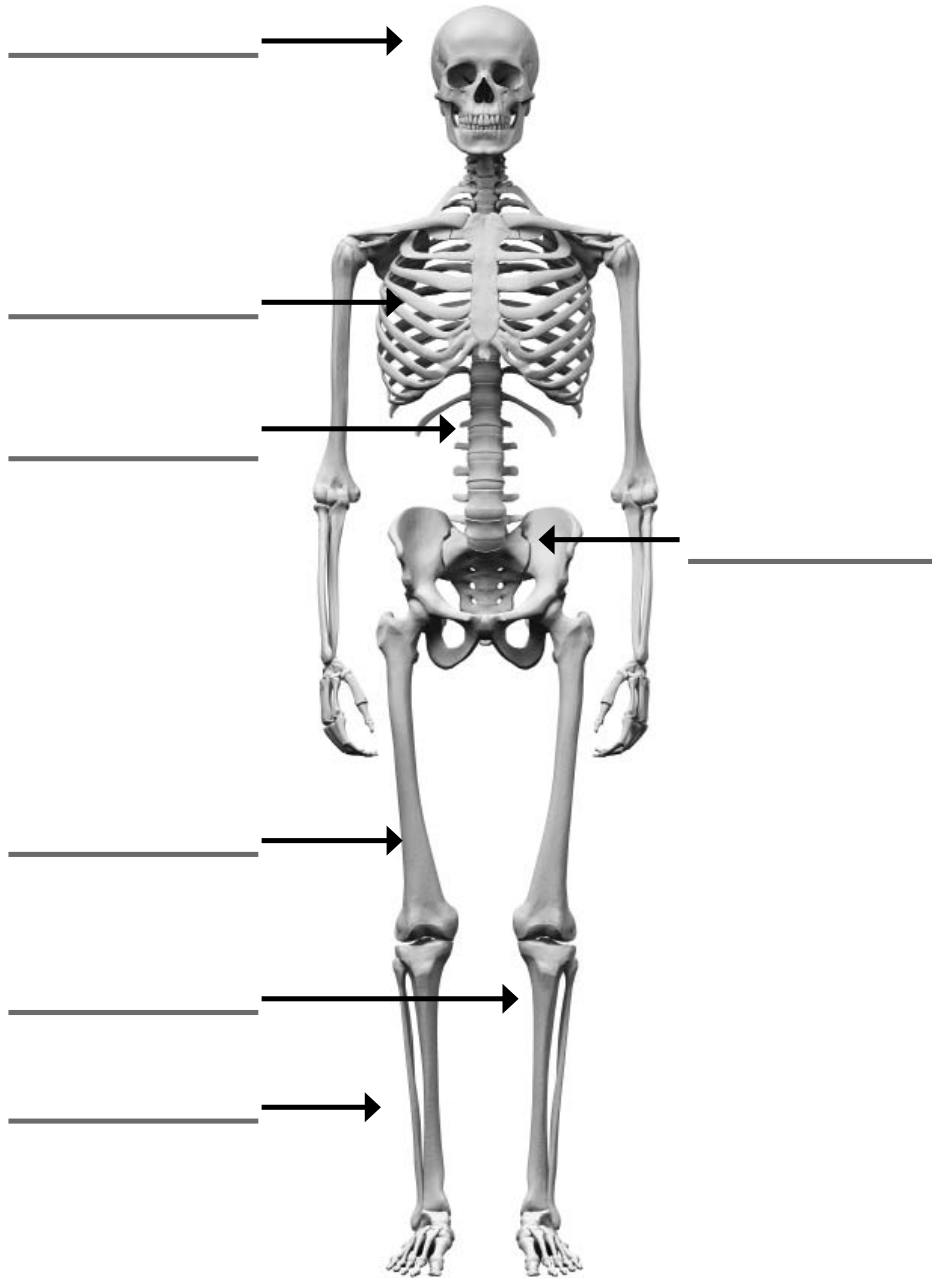
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<http://www.eyeland-design.com/webtools/53828496ca1045c06/53828496bd08d7c0c/index.html>
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<http://www.eyeland-design.com/webtools/53828496ca1045c06/53828496bd08b1006/index.html>

Sense of Sound

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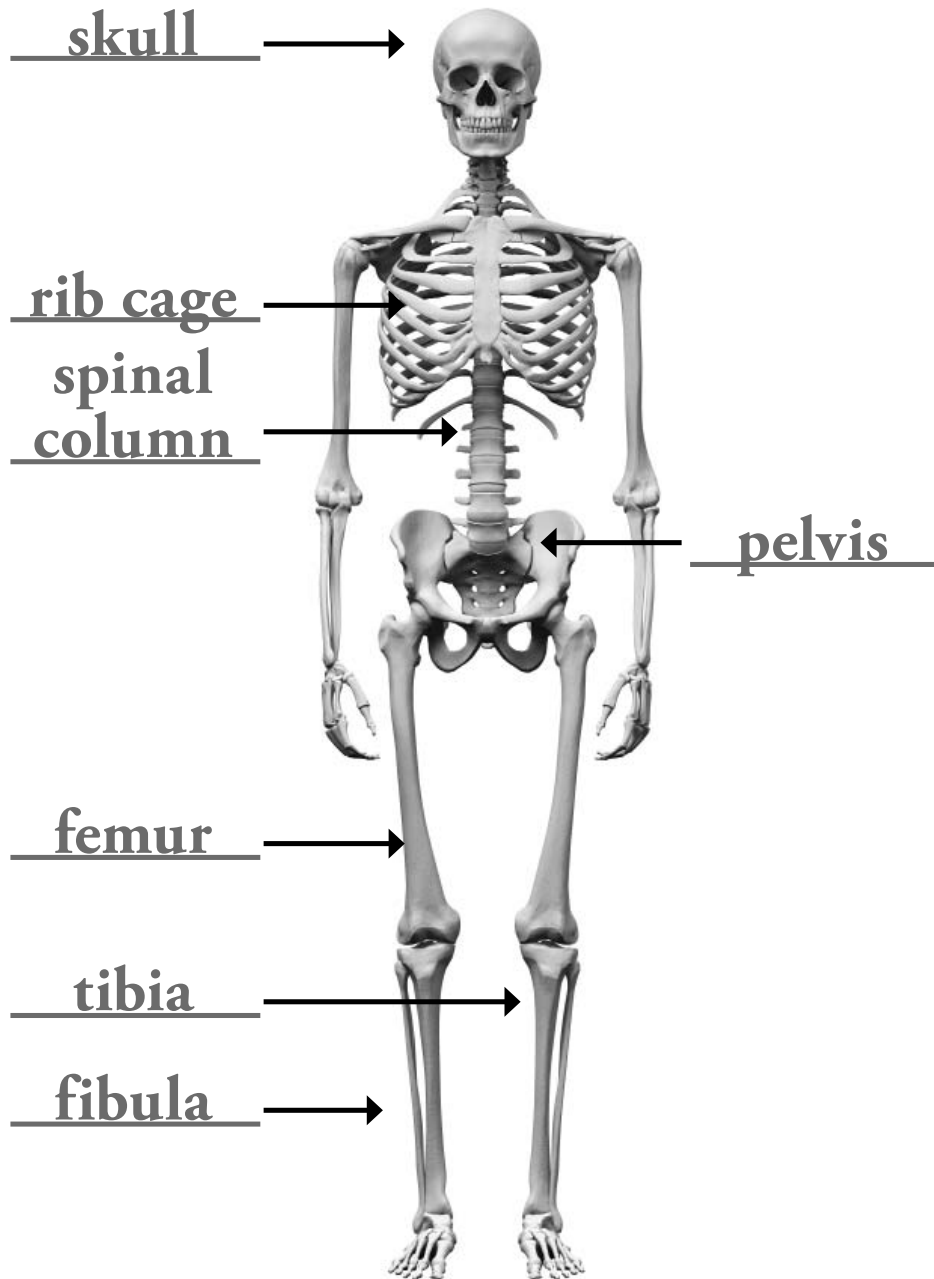
Name: _____

spinal column	skull	femur
pelvis	tibia	rib cage
	fibula	



Directions: Fill in the missing labels of the skeletal system.

spinal column	skull	femur
pelvis	tibia	rib cage
	fibula	



Directions: Fill in the missing labels of the skeletal system.

Name: _____

Directions: Write a summary of what the experiment will test in the first blank section, and write your prediction(s) in the second blank section. After the experiment is complete, write down your observations and explain if your predictions were correct.

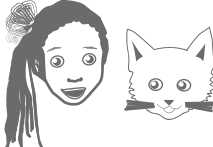

This experiment will test:

I predict that the following will happen:

Were my predictions correct? Why or why not?

Name: _____

Directions: Use this story map to brainstorm ideas for the character(s), setting(s), and plot of your narrative.

Title	
Character(s) 	Setting(s) 
P l o t	Beginning
	Middle
	End

Name: _____



Dear Family Members,

During the next several days, your child will be hearing more about the human body and its interconnected systems. S/he will be learning about the structure of the brain and the functions of its different parts; the parts of the eye and their functions; the parts of the ear and their functions; and ways to keep the body safe and healthy.

Below are some suggestions for activities that you may do at home to reinforce what your child is learning about the human body and its systems and senses.

1. Sayings and Phrases: A Clean Bill of Health

Your child will be learning the saying, “a clean bill of health.” Talk with your child about the meaning of this phrase. In reference to this saying, have your child tell you about the ways in which s/he can stay healthy and injury-free and receive “a clean bill of health” from the doctor. Discuss with your child the importance of having a healthy diet, getting enough exercise, and protecting eyes and ears from injury.

2. Using a Globe or Map

Your child will be learning about the brain and the fact that the brain is divided into two separate hemispheres, or halves. On a globe (or a map, if a globe is not available), have your child show the way Earth is divided into hemispheres similar to the brain’s hemispheres. Discuss with your child the fact that Earth can be divided in half horizontally at the equator to form the Northern Hemisphere and the Southern Hemisphere. Also discuss with your child the fact that Earth can be divided vertically along the Prime Meridian to form the Eastern Hemisphere and the Western Hemisphere. Ask your child to describe what each of the brain’s hemispheres controls.

3. Draw and Write: The Human Eye

Have your child draw and write about the parts of the eye and the function of each part. Your child will be learning that the visible parts of the eye (eye sockets, eyebrows, eyelids, eyelashes, sclera, cornea, iris, and pupil) and the parts of the inner eye (lens, retina, and optic nerve) work together to enable a person to see. Discuss with your child the terms *nearsightedness* and *farsightedness* and how these conditions can be corrected to allow a person to see properly.

4. Draw and Write: The Human Ear

Have your child draw and write about the parts of the ear and the function of each part. Your child will be learning about the three sections of the ear (the outer ear, the middle ear, and the inner ear), the numerous parts of the ear (earflaps, earlobe, ear canal, eardrum, hammer, anvil, stirrup, and cochlea), and how those parts work together to enable a person to hear. Discuss with your child the role the inner ear plays in a person's balance.

5. Words to Use

Below is a list of some of the words that your child will be learning about and using. Try to use these words as they come up in everyday speech with your child.

- *dependent*—Our trip to the beach is dependent on the weather.
- *wondrous*—After the blizzard, Amy was amazed at the wondrous amounts of snow that blanketed the streets and piled against her house.
- *impulses*—The human brain is such a wondrous part of the body that it can interpret nerve impulses from the ear as sound!
- *miraculously*—Although the wind can blow at more than one hundred miles per hour at the top of Mt. Everest, many people have miraculously climbed that mountain.

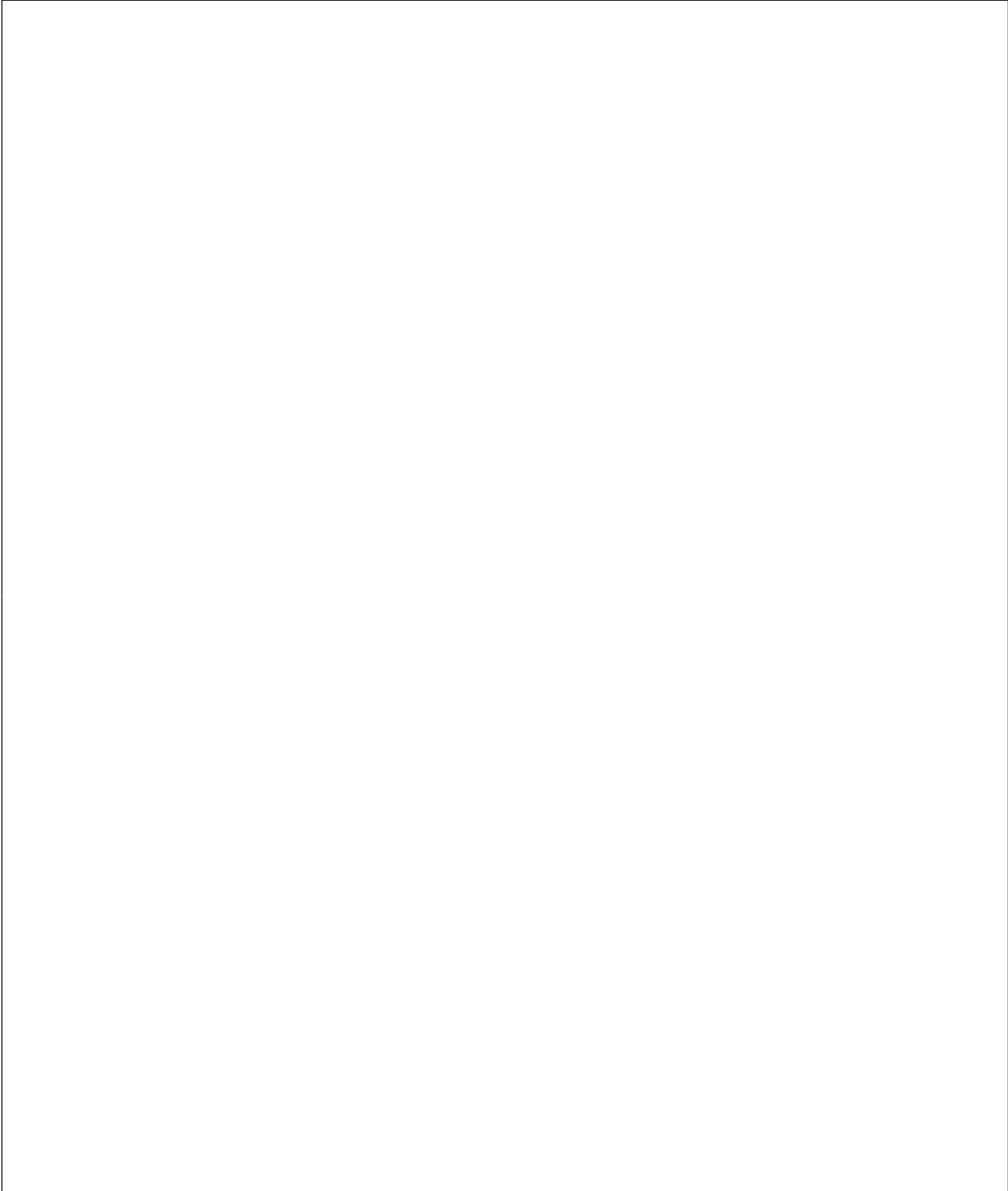
6. Read Aloud Each Day

It is very important that you read with your child every day. Set aside time to read to your child and also time to listen to your child read to you. Please refer back to the list of recommended trade books related to the human body and its interconnected systems that may be found at the library, as well as the list of informative websites.

Be sure to praise your child whenever s/he shares what has been learned at school.

Name: _____

Directions: Use the information from your brainstorming chart to write sentences for the beginning, middle, and end of your narrative.



Revision Checklist

Ask yourself these questions as you revise your paragraphs.

1.	Do I have a good beginning for my narrative?	
2.	Do I describe my character(s) and setting(s)?	
3.	Are there any parts that do not make sense?	
4.	Do my sentences flow well?	
5.	Do I have a good variety of sentence structure?	
6.	Could I combine any of my sentences?	
7.	Do I have a good variety of descriptive words?	
8.	Do I have effective dialogue?	
9.	Do I have a good ending for my narrative?	
10.	Is this my best work?	

Name: _____

Directions: Write the working title of your narrative at the top of the page. Write the revised sentences from your first draft in three paragraphs to tell the beginning, middle, and end of your narrative.

Name: _____

Editing Checklist

Ask yourself these questions as you edit your paragraphs.

1.	Do I have a fitting title?	
2.	Do all of my sentences start with capital letters?	
3.	Do all of my sentences end with the correct punctuation?	
4.	Have I spelled all of my words correctly?	
5.	Have I used correct grammar?	
6.	Does each sentence provide a complete thought?	



A Clean Bill of Health

Today is our last day together. Dr. Welbody is here to help us review some of what we learned about the human body. Take it away, Dr. Welbody!

Hello, everyone! It's so nice to see you again! When Ricardo and I talked last night, I said that I hoped you had learned how to take care of your bodies so that your pediatricians could give you a “clean bill of health.” Does anyone know what I mean by “a clean bill of health?” It's just another way of saying that you're healthy. If someone examines you and finds nothing wrong, they will give you a “clean bill of health.” It's important to know how to keep your bodies healthy, so I will talk to you about that, too.

Humans are made of cells, tiny living units that are the building blocks of their bodies. Similar cells group together to form tissues. Tissues form organs, and organs build systems. All the systems working together form a complicated, interconnected network. Do other mammals have cells, tissues, organs, and systems? Yes, cells are the basic building blocks of all organisms, including all other mammals—and plants, too!

Humans have many interconnected systems, including the circulatory system, the digestive system, the excretory system, the respiratory system, and the three that we talked about the most: the skeletal system, the muscular system, and the nervous system.

Your skeletal system is made up of axial bones and appendicular bones, working together to give your body a sturdy framework for all the other systems. Your vertebrae are stacked in a column, forming your spine.

Together with your protective skull and ribcage, these are your axial bones, running down the center, or axis, of your body. Your legs and arms are attached to your appendicular bones, the shoulder blades and the pelvis.

Can anyone remember what we call the point where two bones meet? This is called a joint. Some joints move, others don't, and some move just a little bit. And what's the name of the connective tissues that wrap around your joints to hold your bones together? These are called ligaments.

What can you do to give your skeletal system a clean bill of health? Diet is important. Make sure that you eat enough foods with calcium to grow strong bones. Milk, broccoli, and dark, leafy greens are good choices. Posture is important, too; make sure that you sit and stand up straight. Keep your back safe by bending your knees when you lift something heavy!

Ropelike tissues called tendons attach your bones to muscles. These skeletal muscles give your bones mobility, allowing you to touch your toes or climb a mountain. Because we control our skeletal muscles, we call them voluntary muscles. There are other muscles that we cannot consciously control. We call these involuntary muscles.

It is important to keep all of your muscles, both voluntary and involuntary, healthy. What can you do to give your muscles a clean bill of health? Diet is important. Muscles need protein found in eggs, meat, beans, and nuts. Exercise strengthens your muscles. Get all the exercise you can as a way of thanking your muscles for keeping you in constant motion.

Your nervous system is your body's command center that communicates with the rest of your body systems and tells them what to do. Your nervous system works closely with your skeletal and muscular systems. Your skeletal

Name: _____

muscles move your skeletal bones, but your muscles get their commands from messages sent by the nervous system. A network of nerves links your brain and spinal cord to muscles and sensory organs all over your body. Nerves collect messages from your brain, from your senses, and from other places inside your body. Many messages can be sent at the same time, as electrical impulses dash around your body in split-second relays. Your nervous system, with your brain acting as its main commander, controls everything you do. Your nervous system is like an electrical system. Electrical wiring, in your house or in your body, can be shorted out if something goes wrong. So, how can you prevent that? How can you give your nervous system a clean bill of health? It's no surprise that diet and exercise are just as important to your nervous system as they are to your other systems. Vitamins and minerals from healthy foods like fresh fruits and vegetables, and protein from different foods, are all important. Drinking lots of water helps, too. Stay away from eating too many sweets and extra salty foods and drinking too much soda. Be sure to get outside every day to play.

All we have left to review are your sensory organs, which include parts of your eyes and ears. Without these sensory organs, you could not hear a story being read or see words or images on the page. What can you do to give your eyes a clean bill of health? Your eyes already have some built-in protection: eyelids, eyebrows, and eyelashes keep dust and sweat away. Two deep sockets in your skull protect your eyeballs. But there are other things that you can do to prevent injury to your eyes. Never look directly at the sun. Avoid bright lights and smoky spaces. Give your eyes a rest, never sitting for too long in front of a computer or a television screen. Wear safety

goggles to protect your eyes from damaging chemicals in pool water or chemicals in a science lab, and wear sunglasses to protect your eyes from the glare of the sunlight shining off things such as polished surfaces or snow.

Your ears are delicate organs as well, so how can you give them a clean bill of health? Most importantly, keep the noise volume down. Ears can be damaged when sounds are too loud. While it is important to keep your outer ears clean, you must never stick anything too far into them. Objects might get stuck or otherwise cause damage to the eardrum.

Well, that brings us to the end of our time together. We've had lots of fun, and I hope you have, too. We hope you've also learned a few things along the way. Here is one last riddle: I am probably the most important three pounds in your body. I help you think and reason. I control your movements, as well as all your senses. I am the one organ that makes humans more advanced than other mammals. What am I? Your brain! Remember to eat a balanced diet and exercise every day. Dr. Welbody and I wish you all a clean bill of health at your next check-up! Bye for now!

Writing Rubric

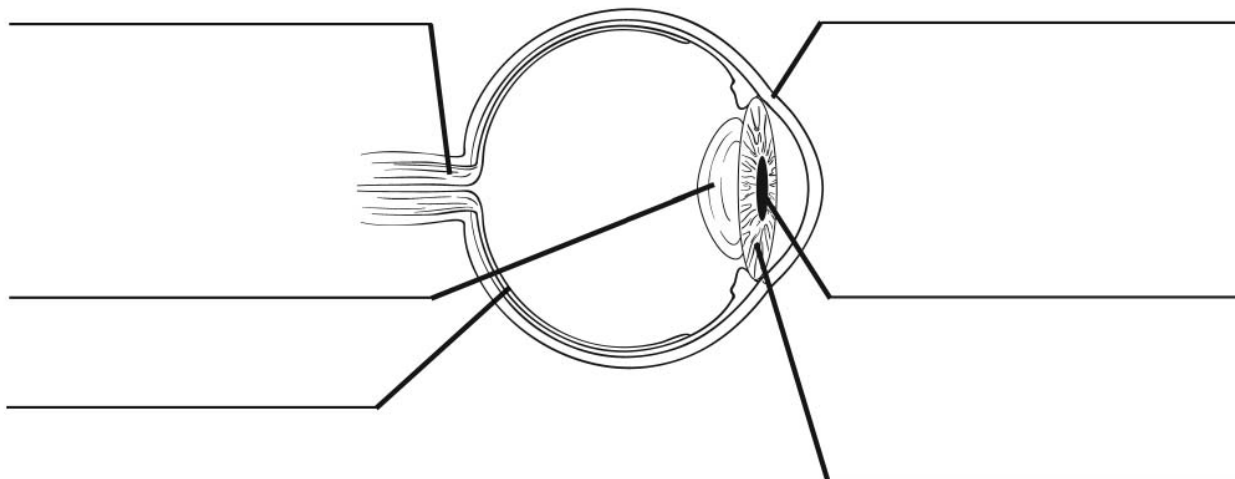
4	<p>The narrative piece follows a logical sequence with a clear beginning, middle, and end.</p> <p>Each paragraph contains transition words that connect the paragraphs and the story smoothly.</p> <p>The narrative piece contains appropriate characters, a setting, a plot, and dialogue.</p> <p>Descriptive language captures the reader's attention.</p> <p>The concluding paragraph explains something about the story that the reader has been waiting to find out.</p> <p>There are no errors in grammar, capitalization, or punctuation.</p>
3	<p>The narrative piece follows a logical sequence with a clear beginning, middle, and end.</p> <p>Each paragraph contains transition words that connect the paragraphs and the story smoothly.</p> <p>The narrative piece contains characters, a setting, a plot, and dialogue.</p> <p>Descriptive language captures the reader's attention.</p> <p>The piece has a good concluding paragraph.</p> <p>There are few errors in grammar, capitalization, or punctuation.</p>

2	<p>The narrative piece has a beginning, middle, and end.</p> <p>Paragraphs have few transition words.</p> <p>The narrative piece contains unfitting characters, setting, plot, and dialogue.</p> <p>Descriptive language is minimally used.</p> <p>The piece has a weak concluding paragraph.</p> <p>There are some errors in grammar, capitalization, or punctuation.</p>
1	<p>The narrative piece does not have a clear beginning, middle, and end.</p> <p>The narrative piece contains unfitting characters, setting, plot, and lacks dialogue.</p> <p>Paragraph completely lack transition words and the story does not flow smoothly.</p> <p>Descriptive language is lacking.</p> <p>The concluding paragraph is missing or ends abruptly.</p> <p>There are many errors in grammar, capitalization, or punctuation.</p>
<p>Teacher Comments:</p>	

Name: _____

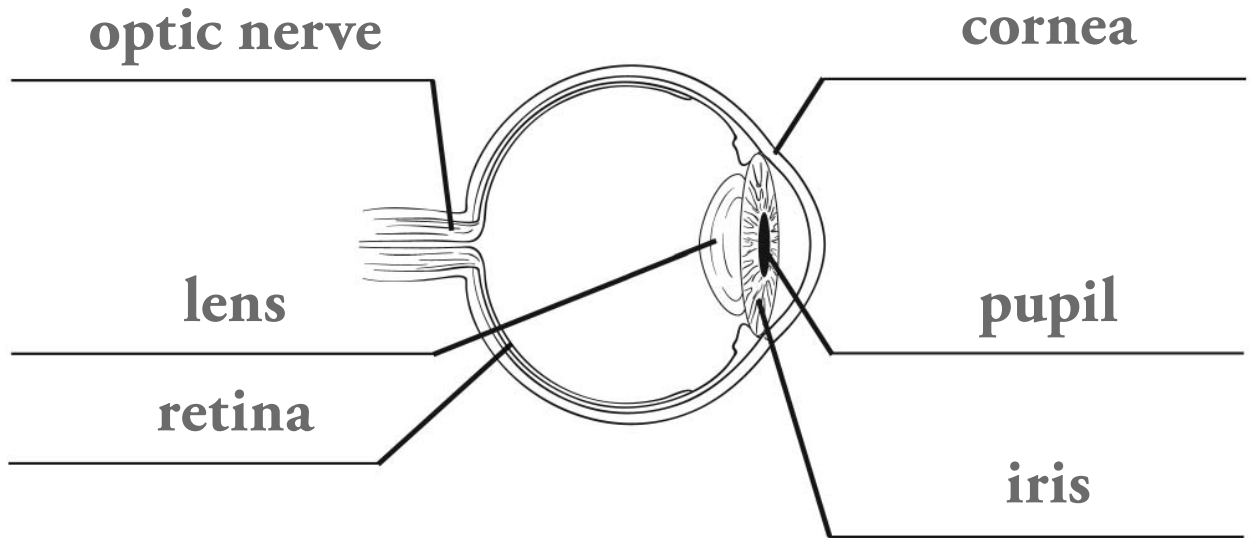
cornea	iris	pupil
optic nerve	retina	lens

Directions: Fill in the labels for the parts of the eye using the words in the box.



cornea	iris	pupil
optic nerve	retina	lens

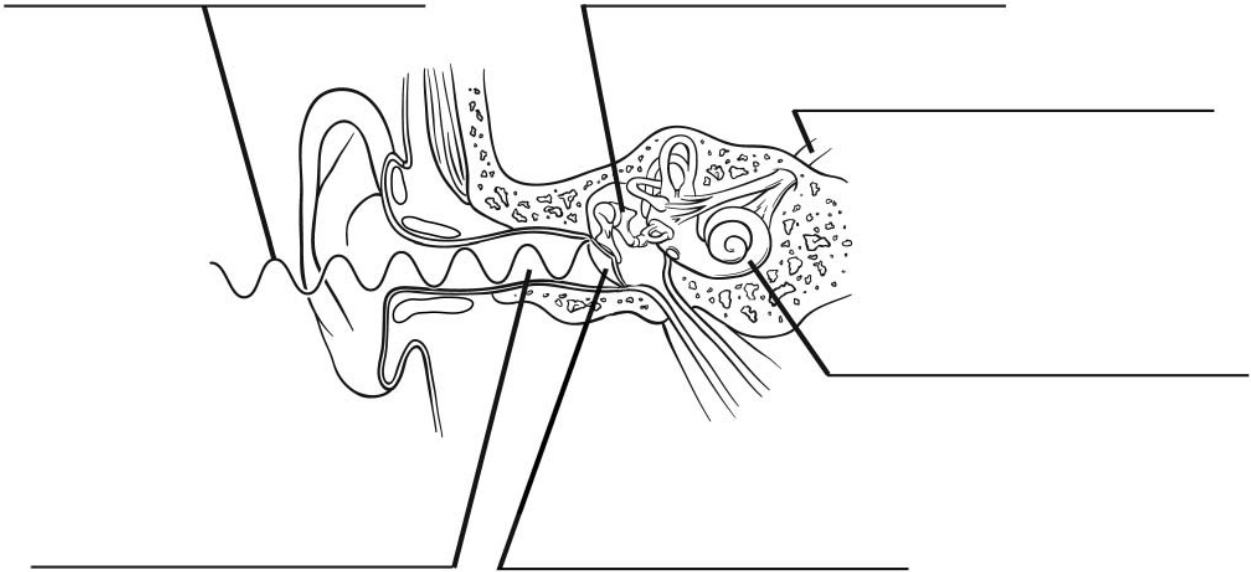
Directions: Fill in the labels for the parts of the eye using the words in the box.



Name: _____

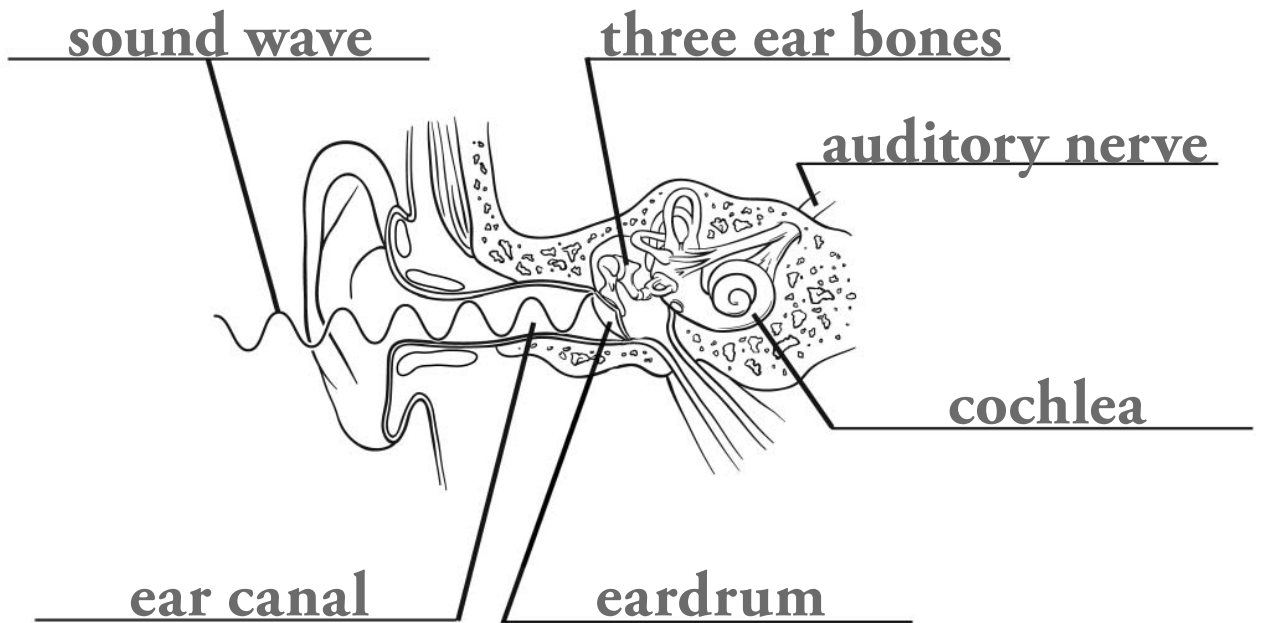
ear canal	sound wave	eardrum
ear bones	auditory nerve	cochlea

Directions: Label the diagram of the human ear using the words in the box.



ear canal	sound wave	eardrum
three ear bones	auditory nerve	cochlea

Directions: Label the diagram of the human ear using the words in the box.



Name: _____

Directions: Listen to the sentence read by the teacher. Read the three words in the row. Circle the best answer for what the teacher has described.

1.	cells	tissues	muscles
2.	hearing aid	x-ray	contact lenses
3.	joints	tibia	fibula
4.	joint	ligament	Achilles heel
5.	cranium	voluntary muscle	reflex
6.	brain	eyeball	spinal cord
7.	senses	receptors	nerves
8.	nose	nerves	fingers
9.	two	five	three
10.	nearsightedness	farsightedness	deafness

Directions: Listen to the sentence read by the teacher. Read the three words in the row. Circle the best answer for what the teacher has described.

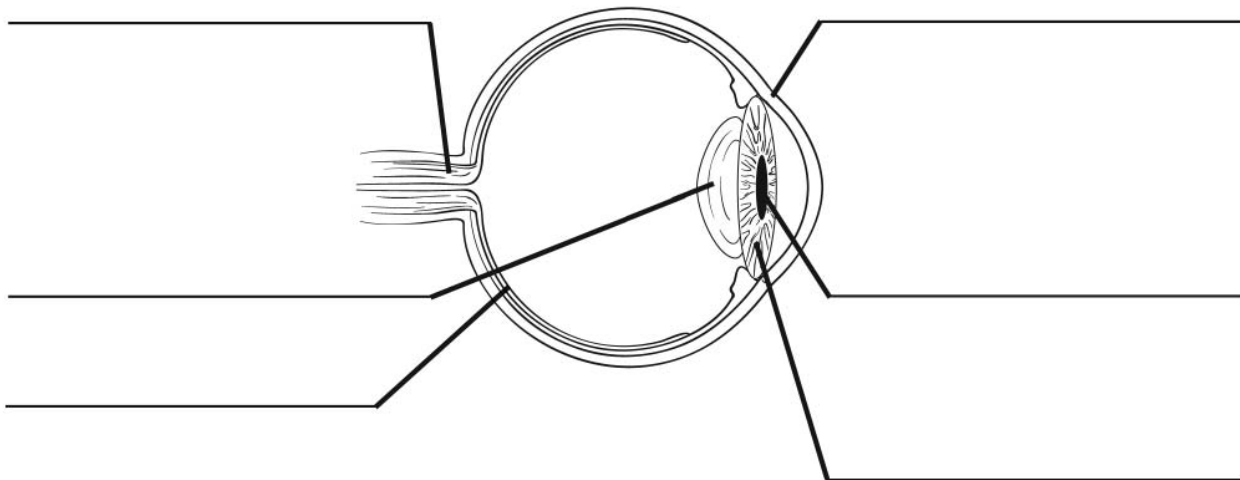
- | | | | |
|-----|-----------------|------------------|----------------|
| 1. | cells | tissues | muscles |
| 2. | hearing aid | x-ray | contact lenses |
| 3. | joints | tibia | fibula |
| 4. | joint | ligament | Achilles heel |
| 5. | cranium | voluntary muscle | reflex |
| 6. | brain | eyeball | spinal cord |
| 7. | senses | receptors | nerves |
| 8. | nose | nerves | fingers |
| 9. | two | five | three |
| 10. | nearsightedness | farsightedness | deafness |

1.	cells	<i>_____ are the building blocks of all life, and most are too small to be seen without a microscope.</i>
2.	x-ray	<i>Doctors may use an _____ to see the skeletal system and treat problems.</i>
3.	joints	<i>Cartilage covers bones where they meet at the _____, helping to protect them.</i>
4.	Achilles heel	<i>The most powerful tendon in the body about which a legend has been told is also known as the _____.</i>
5.	reflex	<i>When you quickly move your hand away from something you are touching that is really hot, this reaction is called a _____.</i>
6.	eyeball	<i>Which is NOT part of the control center of the body: brain, spinal cord, or eyeball?</i>
7.	senses	<i>The five _____ work with the brain to process information about our surroundings.</i>
8.	nerves	<i>The _____ are messengers that transmit information from all of the body parts through the spinal cord to the brain.</i>
9.	two	<i>The brain is divided into _____ hemispheres.</i>
10.	deafness	<i>Which of these cannot be corrected with glasses or contact lenses: farsightedness, nearsightedness, or deafness?</i>

Name: _____

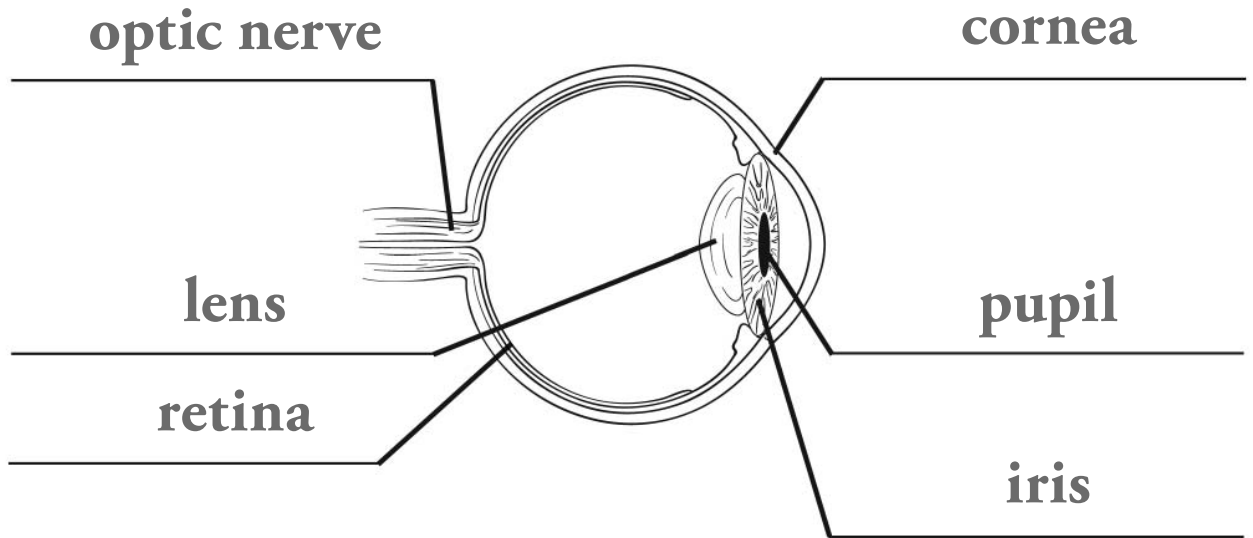
cornea	iris	pupil
optic nerve	retina	lens

Directions: Fill in the labels for the parts of the eye using the words in the box.



cornea	iris	pupil
optic nerve	retina	lens

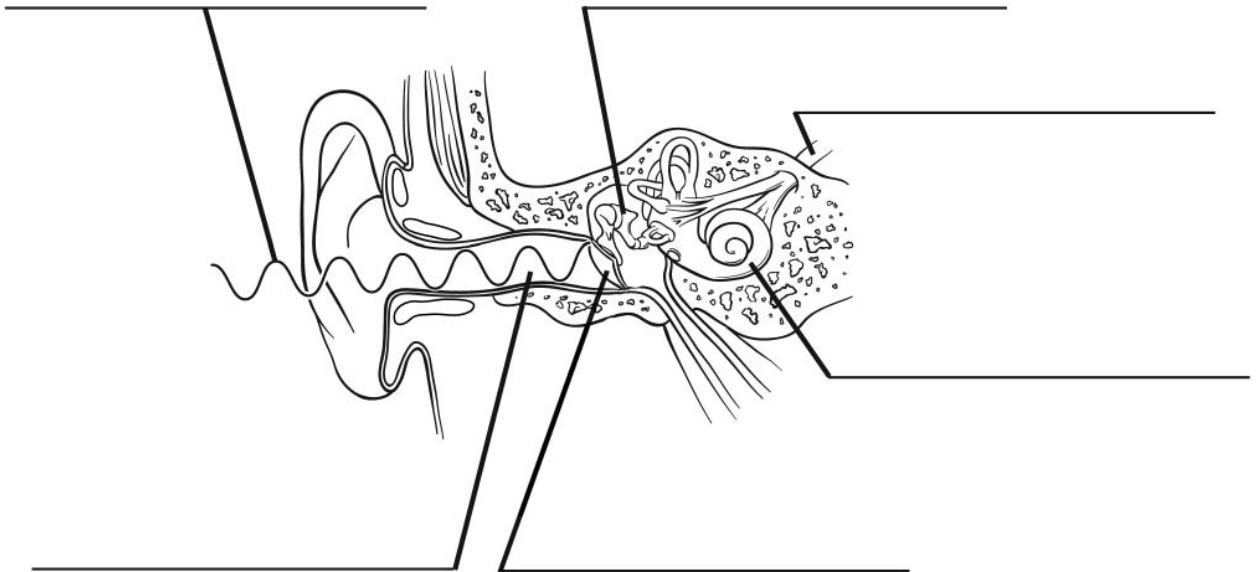
Directions: Fill in the labels for the parts of the eye using the words in the box.



Name: _____

ear canal	sound wave	eardrum
three ear bones	auditory nerve	cochlea

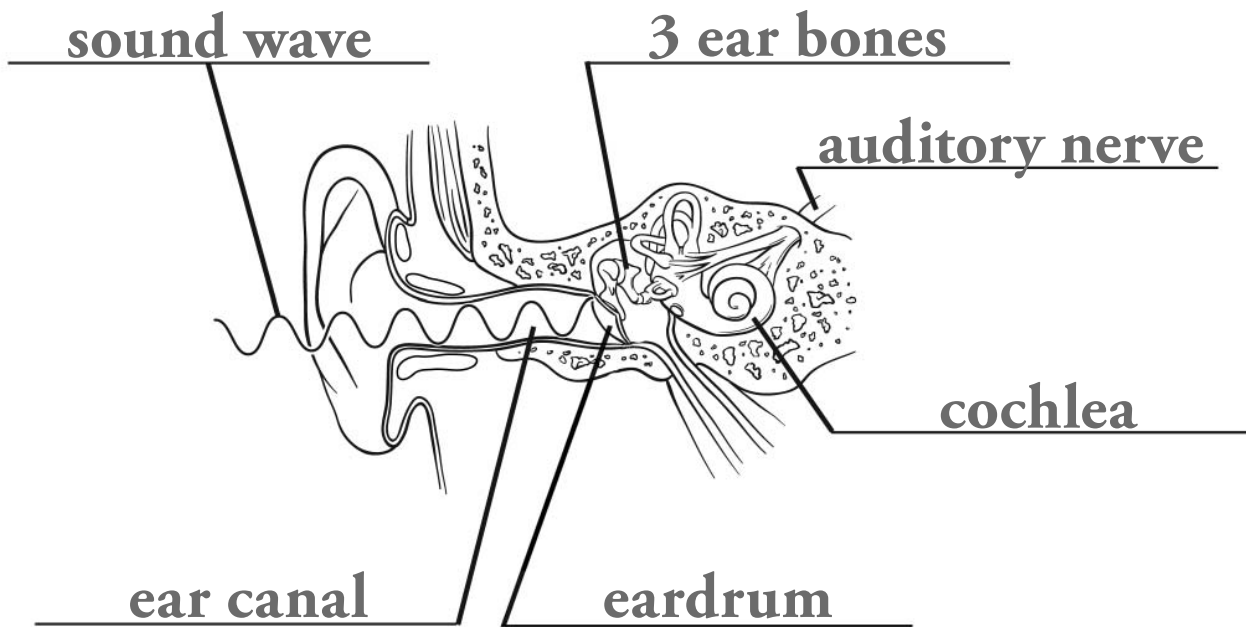
Directions: Label the diagram of the human ear using the words in the box.



Name: Answer Key

ear canal	sound wave	eardrum
three ear bones	auditory nerve	cochlea

Directions: Label the diagram of the human ear using the words in the box.



Name: _____

Directions: Read along as your teacher reads each sentence. Write two or three complete sentences to respond to each statement.

1. Name the three types of joints and give one example of each.

2. Pick one of the following systems and assess how it helps you on a daily basis: skeletal, muscular, nervous.

3. Describe three ways you can help maintain a clean bill of health.

Tens Recording Chart

Use this grid to record Tens scores. Refer to the Tens Conversion Chart that follows.

Name							

Tens Conversion Chart

Number Correct

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	10																			
2	0	5	10																		
3	0	3	7	10																	
4	0	3	5	8	10																
5	0	2	4	6	8	10															
6	0	2	3	5	7	8	10														
7	0	1	3	4	6	7	9	10													
8	0	1	3	4	5	6	8	9	10												
9	0	1	2	3	4	6	7	8	9	10											
10	0	1	2	3	4	5	6	7	8	9	10										
11	0	1	2	3	4	5	5	6	7	8	9	10									
12	0	1	2	3	3	4	5	6	7	8	8	9	10								
13	0	1	2	2	3	4	5	5	6	7	8	8	9	10							
14	0	1	1	2	3	4	4	5	6	6	7	8	9	9	10						
15	0	1	1	2	3	3	4	5	5	6	7	7	8	9	9	10					
16	0	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10				
17	0	1	1	2	2	3	4	4	5	6	6	7	7	8	8	9	9	10			
18	0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10		
19	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	
20	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10

Simply find the number of correct answers the student produced along the top of the chart and the number of total questions on the worksheet or activity along the left side. Then find the cell where the column and the row converge. This indicates the Tens score. By using the Tens Conversion Chart, you can easily convert any raw score, from 0 to 20, into a Tens score.

Please note that the Tens Conversion Chart was created to be used with assessments that have a defined number of items (such as written assessments). However, teachers are encouraged to use the Tens system to record informal observations as well. Observational Tens scores are based on your observations during class. It is suggested that you use the following basic rubric for recording observational Tens scores.

9–10	Student appears to have excellent understanding
7–8	Student appears to have good understanding
5–6	Student appears to have basic understanding
3–4	Student appears to be having difficulty understanding
1–2	Student appears to be having great difficulty understanding
0	Student appears to have no understanding/does not participate

CORE KNOWLEDGE LANGUAGE ARTS

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Catherine S. Whittington

ILLUSTRATORS AND IMAGE SOURCES

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