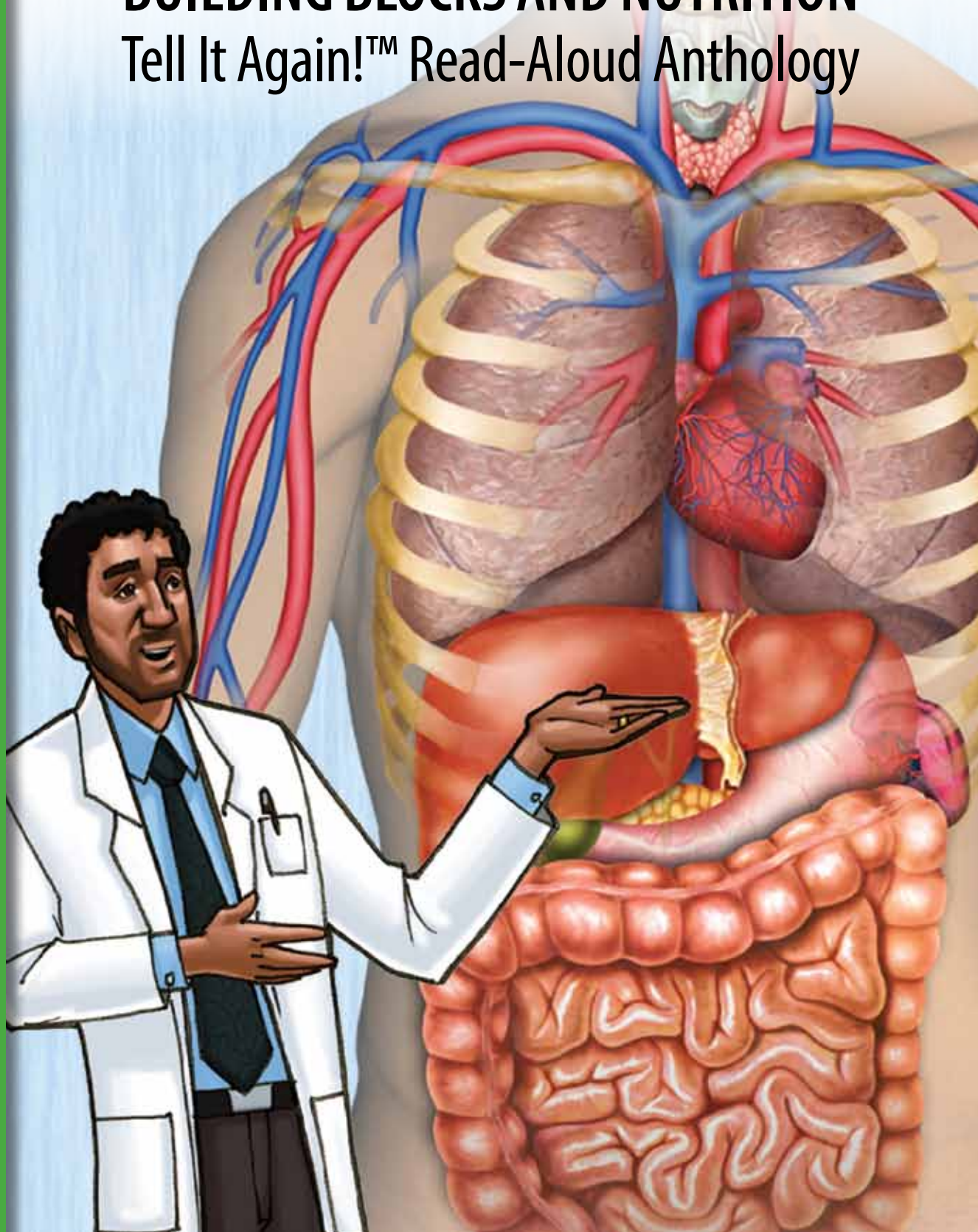




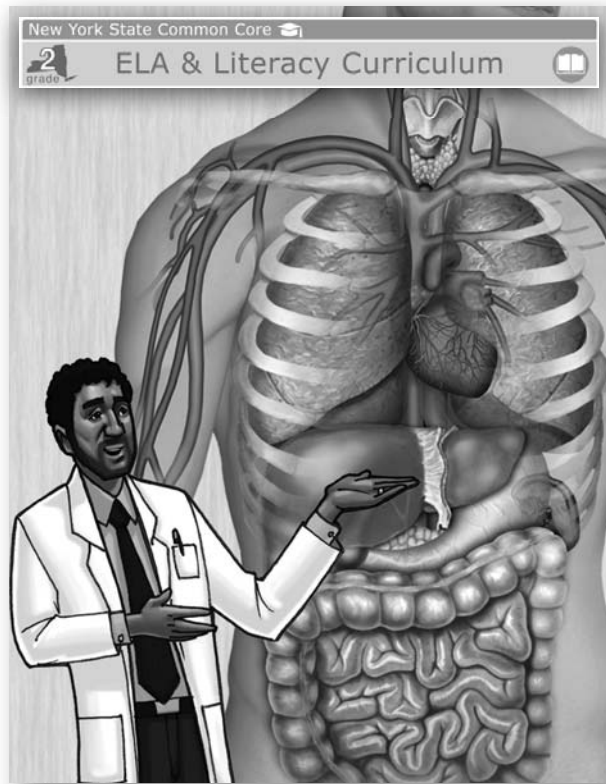
# The Human Body

## BUILDING BLOCKS AND NUTRITION

### Tell It Again!™ Read-Aloud Anthology







# The Human Body

## BUILDING BLOCKS AND NUTRITION

### Tell It Again!™ Read-Aloud Anthology

Listening & Learning™ Strand  
GRADE 2

Core Knowledge Language Arts®  
New York Edition



Core Knowledge®

## Creative Commons Licensing

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.



You are free:

- to Share** — to copy, distribute and transmit the work
- to Remix** — to adapt the work

**Under the following conditions:**

**Attribution** — You must attribute the work in the following manner:

*This work is based on an original work of the Core Knowledge® Foundation made available through licensing under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. This does not in any way imply that the Core Knowledge Foundation endorses this work.*

**Noncommercial** — You may not use this work for commercial purposes.

**Share Alike** — If you alter, transform, or build upon this work, you may distribute the resulting work only under the same or similar license to this one.

**With the understanding that:**

For any reuse or distribution, you must make clear to others the license terms of this work. The best way to do this is with a link to this web page:

<http://creativecommons.org/licenses/by-nc-sa/3.0/>

Copyright © 2013 Core Knowledge Foundation  
[www.coreknowledge.org](http://www.coreknowledge.org)

All Rights Reserved.

Core Knowledge Language Arts, Listening & Learning, and Tell It Again! are trademarks of the Core Knowledge Foundation.

Trademarks and trade names are shown in this book strictly for illustrative and educational purposes and are the property of their respective owners. References herein should not be regarded as affecting the validity of said trademarks and trade names.

Table of Contents

# The Human Body

BUILDING BLOCKS AND NUTRITION

Tell It Again!™ Read-Aloud Anthology

<b>Alignment Chart</b> for <i>The Human Body: Building Blocks and Nutrition</i> . . . . .	v
<b>Introduction</b> to <i>The Human Body: Building Blocks and Nutrition</i> . . . . .	1
<b>Lesson 1:</b> The Amazing Human Body . . . . .	12
<b>Lesson 2:</b> Anton van Leeuwenhoek . . . . .	27
<b>Lesson 3:</b> Cells and Tissues . . . . .	39
<b>Lesson 4:</b> Organs . . . . .	52
<b>Pausing Point</b> . . . . .	65
<b>Lesson 5:</b> The Digestive System . . . . .	69
<b>Lesson 6:</b> The Excretory System . . . . .	80
<b>Lesson 7:</b> Nutrients . . . . .	91
<b>Lesson 8:</b> A Well-Balanced Diet . . . . .	103
<b>Lesson 9:</b> A Healthy Human Body . . . . .	115
<b>Domain Review</b> . . . . .	127
<b>Domain Assessment</b> . . . . .	131
<b>Culminating Activities</b> . . . . .	135
<b>Appendix</b> . . . . .	137



## Alignment Chart for The Human Body: Building Blocks and Nutrition

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: Building Blocks and Nutrition

	Lesson								
	1	2	3	4	5	6	7	8	9
<b>Core Content Objectives</b>									
Identify the five senses and associated body parts	✓								
Identify the skeletal, muscular, circulatory, nervous, digestive, and excretory systems as important systems in the human body	✓								✓
Describe the significant contributions of Anton van Leeuwenhoek		✓							
Explain that all living things are made of microscopic cells			✓						
Describe the relationship among cells, tissues, organs, and systems			✓	✓					✓
Identify important components of the digestive system and their functions					✓				
Describe the process of nourishing the body from the time food is taken into the mouth until waste is removed from the body					✓				
Identify important components of the excretory system and their functions						✓			
Describe how the digestive and excretory systems work together						✓			
Explain the importance of vitamins and minerals to the body							✓		
Explain the importance of eating a balanced diet								✓	
Classify foods as healthy or unhealthy								✓	
Plan a daily balanced diet								✓	










**Alignment Chart for *The Human Body: Building Blocks and Nutrition***

**Lesson**


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

**Reading Standards for Literature: Grade 2**











**Key Ideas and Details**

STD RI.2.1	Ask and answer such questions as <i>who</i> , <i>what</i> , <i>where</i> , <i>when</i> , <i>why</i> , and <i>how</i> to demonstrate understanding of key details in a text.									
CKLA Goal(s)	Ask and answer questions (e.g., <i>who</i> , <i>what</i> , <i>where</i> , <i>when</i> , <i>why</i> , <i>how</i> ), orally or in writing, requiring literal recall and understanding of the details and/or facts of a nonfiction/informational read-aloud									
	Answer questions that require making interpretations, judgments, or giving opinions about what is heard in a nonfiction/informational read-aloud, including answering <i>why</i> questions that require recognizing cause/effect relationships									
STD RI.2.3	Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.									
CKLA Goal(s)	Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a nonfiction/informational read-aloud									

**Craft and Structure**

<b>STD RI.2.4</b>	Determine the meaning of words and phrases in a text relevant to a Grade 2 topic or subject area.								
<b>CKLA Goal(s)</b>	Determine the meaning of unknown words and phrases in nonfiction/informational read-alouds and discussions								














**Integration of Knowledge and Ideas**

<b>STD RI.2.7</b>	Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.								
<b>CKLA Goal(s)</b>	Interpret information from diagrams, charts, timelines, graphs, or other organizers associated with a nonfiction/informational read-aloud and explain how these graphics clarify the meaning of the read-aloud								
<b>STD RI.2.8</b>	Describe how reasons support specific points the author makes in a text.								
<b>CKLA Goal(s)</b>	Describe how reasons or facts support specific points the author makes in a nonfiction/informational read-aloud								
<b>STD RI.2.9</b>	Compare and contrast the most important points presented by two texts on the same topic.								
<b>CKLA Goal(s)</b>	Compare and contrast (orally or in writing) similarities and differences within a single nonfiction/informational read-aloud or between two or more nonfiction/informational read-alouds								





**Alignment Chart for The Human Body: Building Blocks and Nutrition**

**Lesson**

Alignment Chart for The Human Body: Building Blocks and Nutrition					1	2	3	4	5	6	7	8	9
Range of Reading and Level of Text Complexity													
STD RI.2.10	By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the Grades 2–3 text complexity band proficiently, with scaffolding as needed at the high end of the range.												
CKLA Goal(s)	Listen to and demonstrate understanding of nonfiction/informational read-alouds of appropriate complexity for Grades 2–4												
Writing Standards: Grade 2													
Research to Build and Present Knowledge													
STD W.2.8	Recall information from experiences or gather information from provided sources to answer a question.												
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												
	With assistance, categorize and organize facts and information within a given domain to answer questions												
Speaking and Listening Standards: Grade 2													
Comprehension and Collaboration													
STD SL.2.1	Participate in collaborative conversations with diverse partners about Grade 2 topics and texts with peers and adults in small and large groups.												
STD SL.2.1a	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, e.g., look at and listen to the speaker, raise hand to speak, take turns, say “excuse me” or “please,” etc.												
STD SL.2.1b	Build on others’ talk in conversations by linking their comments to the remarks of others.												
CKLA Goal(s)	Carry on and participate in a conversation over at least six turns, staying on topic, linking their comments to the remarks of others, with either an adult or another child of the same age												
STD SL.2.1c	Ask for clarification and further explanation as needed about the topics and texts under discussion.												
CKLA Goal(s)	Ask questions to clarify information about the topic in a fiction or nonfiction/informational read-aloud												

**Alignment Chart for The Human Body: Building Blocks and Nutrition**

**Lesson**

Alignment Chart for The Human Body: Building Blocks and Nutrition		1	2	3	4	5	6	7	8	9
Presentation of Knowledge and Ideas										
STD SL.2.4	Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.									
CKLA Goal(s)	Recount a personal experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences	✓								✓
STD SL.2.5	Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.									
CKLA Goal(s)	Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings							✓		
STD SL.2.6	Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification. (See Grade 2 Language.)									
CKLA Goal(s)	Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification									
Language Standards: Grade 2										
Vocabulary Acquisition and Use										
STD L.2.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on Grade 2 reading and context, choosing flexibly from an array of strategies.									
STD L.2.4b	Determine the meaning of the new word formed when a known prefix is added to a known word (e.g., <i>happy/unhappy</i> , <i>tell/retell</i> ).									
CKLA Goal(s)	Use word parts to determine meanings of unknown words in fiction or nonfiction/informational read-alouds and discussions					✓				
STD L.2.5	Demonstrate understanding of word relationships and nuances in word meanings.									
STD L.2.5a	Identify real-life connections between words and their use (e.g., describe foods that are <i>spicy</i> or <i>juicy</i> ).									
CKLA Goal(s)	Identify real-life connections between words and their use (e.g., describe foods that are <i>spicy</i> or <i>juicy</i> )									
	Determine the meaning of unknown and multiple meaning words and phrases in fiction or nonfiction/informational read-alouds and discussions			✓					✓	

**Alignment Chart for The Human Body: Building Blocks and Nutrition**

Alignment Chart for The Human Body: Building Blocks and Nutrition		Lesson								
		1	2	3	4	5	6	7	8	9
STD L.2.6	Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using adjectives and adverbs to describe (e.g., <i>When other kids are happy that makes me happy</i> ).									
CKLA Goal(s)	Learn the meaning of common sayings and phrases	✓								✓
	Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using adjectives and adverbs to describe (e.g., <i>When other kids are happy that makes me happy</i> )	<div>✓</div>								
Additional CKLA Goals										
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 story or topic to be read aloud							✓		✓	✓
Sequence five pictures illustrating the digestive process						✓				



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.





# Introduction to The Human Body: Building Blocks and Nutrition

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

This domain includes a Pausing Point after Lesson 4 when students have covered the topic of organs. At the end of the domain, a Domain Review, a Domain Assessment, and Culminating Activities are included to allow time to review, reinforce, assess, and remediate content knowledge. **You should spend no more than thirteen days total on this domain.**

Week One				
Day 1	Day 2 #	Day 3 #	Day 4 #	Day 5 ⑩#
Lesson 1A: “The Amazing Human Body” (40 min.)	Lesson 2A: “Anton van Leeuwenhoek” (40 min.)	Lesson 3A: “Cells and Tissues” (40 min.)	Lesson 4A: “Organs” (40 min.)	Pausing Point (60 min.)
Lesson 1B: Extensions (20 min.)	Lesson 2B: Extensions (20 min.)	Lesson 3B: Extensions (20 min.)	Lesson 4B: Extensions (20 min.)	
60 min.	60 min.	60 min.	60 min.	60 min.

Week Two				
Day 6 #	Day 7	Day 8	Day 9 #	Day 10
Lesson 5A: “The Digestive System” (40 min.)	Lesson 6A: “The Excretory System” (40 min.)	Lesson 7A: “Nutrients” (40 min.)	Lesson 8A: “A Well-Balanced Diet” (40 min.)	Lesson 9A: “A Healthy Human Body” (40 min.)
Lesson 5B: Extensions (20 min.)	Lesson 6B: Extensions (20 min.)	Lesson 7B: Extensions (20 min.)	Lesson 8B: Extensions (20 min.)	Lesson 9B: Extensions (20 min.)
60 min.	60 min.	60 min.	60 min.	60 min.

Week Three		
Day 11 #	Day 12 ⑩	Day 13 #
Domain Review (60 min.)	Domain Assessment (60 min.)	Culminating Activities (60 min.)
60 min.	60 min.	60 min.

⑩ Lessons include Student Performance Task Assessments

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

## ***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: Building Blocks and Nutrition*
- *Tell It Again! Image Cards* for *The Human Body: Building Blocks and Nutrition*
- *Tell It Again! Supplemental Guide* for *The Human Body: Building Blocks and Nutrition*

\*The *Tell It Again! Posters* and *Multiple Meaning Word Posters* for *The Human Body: Building Blocks and Nutrition* are found at the end of the *Tell It Again! Flip Book*.

Recommended Resource:

- *Core Knowledge Grade 2 Teacher Handbook*, edited by E. D. Hirsch, Jr. and Souzanne A. Wright (Core Knowledge Foundation, 2005) ISBN 978-1890517748

## ***Why The Human Body: Building Blocks and Nutrition is Important***

---

This domain covers a number of topics regarding the human body. This domain first covers concepts regarding cells and how cells form the building blocks of life on Earth. Students are then taught how collections of cells form tissues, and tissues form organs, and finally how organs work within the various body systems. In addition, students are taught about Anton van Leeuwenhoek and his work with the microscope and his discovery of the tiny one-celled bacteria.

Students will then hear about the digestive and excretory systems. They will learn the fundamental parts and functions of these two body systems. The narrator of these read-alouds is a nutritionist named Nick Nutri, who reinforces basic facts that students will be learning.

The remainder of this domain focuses on the importance of good nutrition and how to make good choices in order to eat a well-balanced diet. Students will be taught five keys to good health—eat well, exercise, sleep, keep clean, and have regular checkups.

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

---

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: Building Blocks and Nutrition*. This background knowledge will greatly enhance students' understanding of the read-alouds they are about to enjoy:

### ***The Five Senses (Kindergarten)***

- Identify and describe the five senses: sight, hearing, smell, taste, and touch
- Identify the body parts associated with the five senses
- Provide simple explanations about how the eyes, ears, nose, tongue, and skin work
- Describe how the five senses help people learn about their world
- Describe some ways the five senses help protect people from harm
- Describe ways people take care of their bodies and protect them 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
- Identify the skeletal, muscular, digestive, circulatory, and nervous systems
- Recall basic facts about the skeletal, muscular, digestive, circulatory, and nervous systems
- Identify the heart as a muscle that never stops working
- Explain the importance of exercise and a balanced diet for bodily health
- Identify the brain as the body's control center
- Explain that germs can cause disease in the body

- Identify Edward Jenner as the man who developed the first vaccine
- Identify Louis Pasteur as the man who discovered pasteurization
- Explain the importance of exercise, cleanliness, a balanced diet, and rest for bodily health
- Explain the importance of regular checkups
- Explain how vaccinations can prevent disease
- Explain that the food pyramid is one way to depict a balanced diet
- Identify the component food groups in a balanced diet



## ***Core Vocabulary for The Human Body: Building Blocks and Nutrition***

---

The following list contains all of the core vocabulary words in *The Human Body: Building Blocks and Nutrition* in the forms in which they appear in the domain. These words appear in the read-alouds or, in some instances, in the “Introducing the Read-Aloud” section at the beginning of the lesson. Boldfaced words in the list have an associated Word Work activity. 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 all lessons, they should acquire a good understanding of most of these words and begin to use some of them in conversation.

### **Lesson 1**

---

nutrients  
nutrition  
nutritionist  
organs  
**systems**  
vaccinations

### **Lesson 2**

---

bacteria  
lens  
magnifies  
microscope  
**observations**

### **Lesson 3**

---

cells  
**functions**  
microscopic  
stimulus  
tissue

### **Lesson 4**

---

collapse  
kidneys  
liver  
**nourish**  
transplant

### **Lesson 5**

---

**absorb**  
esophagus  
filtering  
saliva  
villi

### **Lesson 6**

---

bladder  
excrete  
regulate  
sweat  
**toxic**

### **Lesson 7**

---

carbohydrates  
**essential**  
fats  
minerals  
proteins

### **Lesson 8**

---

fiber  
moderation  
scan  
**variety**  
well-balanced diet

### **Lesson 9**

---

calories  
network  
**recovery**  
terms  
windpipe

## Comprehension Questions

---

In the *Tell It Again! Read-Aloud Anthology* for *The Human Body: Building Blocks and Nutrition*, there are three types of comprehension questions. *Literal* questions assess students' recall of key details from the read-aloud; these questions are text dependent, requiring students to paraphrase and/or refer back to the portion of the read-aloud in which the specific answer to the question is provided. These questions generally address Reading Standards for Literature 1 (RL.2.1) and Reading Standards for Informational Text 1 (RI.2.1).

*Inferential* questions ask students to infer information from the text and think critically; these questions are also text dependent, but require students to paraphrase and/or refer back to the different portions of the read-aloud that provide information leading to and supporting the inference they are making. These questions generally address Reading Standards for Literature 2 through 5 (RL.2.2–RL.2.5) and Reading Standards for Informational Text 2 through 4, and 6 (RI.2.2–RI.2.4; RI.2.6).

*Evaluative* questions ask students to build upon what they have learned from the text using analytical and application skills; these questions are also text dependent, but require students to paraphrase and/or refer back to the portion(s) of the read-aloud that substantiate the argument they are making or the opinion they are offering. *Evaluative* questions might ask students to describe how reasons or facts support specific points in a read-aloud, which addresses Reading Standards for Informational Text 8 (RI.2.8). *Evaluative* questions might also ask students to compare and contrast information presented within a read-aloud or between two or more read-alouds, addressing Reading Standards for Literature 9 (RL.2.9) and Reading Standards for Informational Text 9 (RI.2.9).

The *Tell It Again! Read-Aloud Anthologies* include complex texts, thus preparing students in these early years for the increased vocabulary and syntax demands aligned texts will present in later grades. As all of the readings incorporate a variety of illustrations, Reading Standards for Literature 7 (RL.2.7) and Reading Standards for Informational Text 7 (RI.2.7) are addressed as well.

## Student Performance Task Assessments

---

In the *Tell It Again! Read-Aloud Anthology* for *The Human Body: Building Blocks and Nutrition*, there are numerous opportunities to assess students' learning. These assessment opportunities range from informal observations, such as *Think Pair Share* and some Extension activities, to more formal written assessments. These Student Performance Task Assessments (SPTA) are identified in the *Tell It Again! Read-Aloud Anthology* with this icon: 10. There is also an end-of-domain summative assessment. Use the Tens Conversion Chart located in the Appendix to convert a raw score on each SPTA into a Tens score. On the same page, you will also find the rubric for recording observational Tens scores.

## Above and Beyond

---

In the *Tell It Again! Read-Aloud Anthology* for *The Human Body: Building Blocks and Nutrition*, there are numerous opportunities in the lessons and the Pausing Point to challenge students who are ready to attempt activities that are above grade-level. These activities are labeled “Above and Beyond” and are identified with this icon: ↗.

## Supplemental Guide

---

Accompanying the *Tell It Again! Read-Aloud Anthology* is a *Supplemental Guide* designed specifically to assist educators who serve students with limited English oral language skills or students with limited home literary experience, which may include English Language Learners (ELLs) and children with special needs. Teachers whose students would benefit from enhanced oral language practice may opt to use the *Supplemental Guide* as their primary guide in the Listening & Learning Strand. Teachers may also choose to begin a domain by using the *Supplemental Guide* as their primary guide before transitioning to the *Tell It Again! Read-Aloud Anthology*, or may choose individual activities from the *Supplemental Guide* to augment the content covered in the *Tell It Again! Read-Aloud Anthology*.

The *Supplemental Guide* activities that may be particularly relevant to any classroom are the Multiple Meaning Word Activities and

accompanying Multiple Meaning Word Posters, which help students determine and clarify different meanings of words; Syntactic Awareness Activities, which call students' attention to sentence structure, word order, and grammar; and Vocabulary Instructional Activities, which place importance on building students' general academic, or Tier 2, vocabulary. These activities afford all students additional opportunities to acquire a richer understanding of the English language. Several of these activities have been included as Extensions in the *Tell It Again! Read-Aloud Anthology*. In addition, several words in the *Tell It Again! Read-Aloud Anthology* are underlined, indicating that they are multiple-meaning words. The accompanying sidebars explain some of the more common alternate meanings of these words. *Supplemental Guide* activities included in the *Tell It Again! Read-Aloud Anthology* are identified with this icon: ↔.

## ***Recommended Resources for The Human Body: Building Blocks and Nutrition***

---

### **Trade Book List**

---

The *Tell It Again! Read-Aloud Anthology* includes a number of opportunities in Extensions, Pausing Point, and the Culminating Activities for teachers to select trade books from this list to reinforce domain concepts through the use of authentic literature. In addition, teachers should consider other times throughout the day when they might infuse authentic, domain-related literature. If you recommend that families read aloud with their child each night, you may wish to suggest that they choose titles from this trade book list to reinforce the domain concepts. You might also consider creating a classroom lending library, allowing students to borrow domain-related books to read at home with their families.

1. *Bones: Our Skeletal System*, by Seymour Simon  
(HarperCollins, 2000) ISBN 978-0688177218
2. *The Bones Book and Skeleton*, by Stephen Cumbaa (Workman Publishing Company, 2006) ISBN 978-0761142188
3. *The Brain: Our Nervous System*, by Seymour Simon  
(HarperCollins, 2006) ISBN 978-0060877194

4. *Cells, Tissues, and Organs*, by Richard Spilsbury (Heinemann Library, 2008) ISBN 978-1432909048
5. *The Digestive System*, by Rebecca L. Johnson (Lerner Publications Company, 2005) ISBN 978-0822512479
6. *The Digestive System*, by Kirstin Petrie MS, RD (ABDO Publishing Company, 2007) ISBN 978-159679710
7. *The Digestive System*, by Christine Taylor-Butler (Scholastic Inc., 2008) ISBN 978-0531207314
8. *Dinosaurs Alive and Well!: A Guide to Good Health*, by Marc Brown and Laurie Krasny Brown (Little, Brown Books for Young Readers, 1992) ISBN 978-0316110099
9. *The Dynamic Digestive System: How Does My Stomach Work?*, by John Burnstein (Crabtree Publishing Company, 2009) ISBN 978-0778744290
10. *The Edible Pyramid: Good Eating Every Day*, by Loreen Leedy (Holiday House, 1994) ISBN 978-0823420742
11. *Food and Digestion*, by Andrew Solway (Sea-to-Sea Publications, 2011) ISBN 978-1597712644
12. *Good Enough to Eat: A Kid's Guide to Food and Nutrition*, by Lizzy Rockwell (HarperCollins, 2009) ISBN 978-0064451741
13. *Greg's Microscope*, by Millicent E. Selsam, illustrated by Arnold Lobel (HarperCollins, 1990) ISBN 978-0064441445
14. *Gurgles and Growls: Learning About Your Stomach*, by Pamela Hill Nettleton (Picture Window Books, 2004) ISBN 978-1404805040
15. *Guts: Our Digestive System*, by Seymour Simon (HarperCollins Publishers, 2005) ISBN 978-0060546519
16. *The Human Body*, by Seymour Simon (Collins, 2008) ISBN 978-0060555412
17. *The Magic School Bus: Inside the Human Body*, by Joanna Cole, illustrated by Bruce Degen (Scholastic Audio Books, 2011) ISBN 978-0545240833
18. *Muscles: Our Muscular System*, by Seymour Simon (HarperCollins, 2000) ISBN 978-0688177201

19. *My Food Pyramid: Eat Right. Exercise. Have Fun.*, by Alisha Niehaus (Dorling Kindersley Limited, 2007) ISBN 978-0756629939
20. *My Organ Buddies*, by Lee Downing and Felice Downing (Organ Buddies, Inc, 2010) ISBN 978-0615329406
21. *Parts*, by Tedd Arnold (Puffin, 2000) ISBN 978-0140565331
22. *The Race Against Junk Food (Adventures in Good Nutrition)*, by Anthony Buono and Roy Nemerson (HCOM Inc., 1997) ISBN 978-0965810807
23. *The Quest to Digest*, by Mary K. Corcoran (Charlesbridge, 2006) ISBN 978-1570916649
24. *Ultra-Organized Cell Systems*, by Rebecca L. Johnson (Millbrook Press, 2008) ISBN 978-0822571384
25. *What Am I Made Of?*, by David Bennett, illustrated by Stuart Trotter (Aladdin Paperbacks, 1991) ISBN 978-0689714900
26. *Where Does Your Food Go?*, by Wiley Blevins (Scholastic Inc., 2003) ISBN 978-0516258607

## Websites and Other Resources

---

### Student Resources

1. How the Human Body Works (various systems)  
[http://kidshealth.org/kid/htbw/htbw\\_main\\_page.html](http://kidshealth.org/kid/htbw/htbw_main_page.html)
2. Human Body Systems Game  
<http://sciencenetlinks.com/media/filer/2011/10/13/allsystems.swf>
3. I Know That  
<http://www.iknowthat.com/com/L3?Area=Science%20Lab>
4. Mission Nutrition  
[http://kidshealth.org/kid/games/mission\\_nutrition.html#cat20918](http://kidshealth.org/kid/games/mission_nutrition.html#cat20918)
5. A Ride Through the Human Body  
<http://www.healthexplorationstation.com/fun/hes2.htm>
6. Science Interactive Body  
[http://www.bbc.co.uk/science/humanbody/body/interactives/3djigsaw\\_02/index.shtml?muscles](http://www.bbc.co.uk/science/humanbody/body/interactives/3djigsaw_02/index.shtml?muscles)

### ***Teacher Resources***

7. **Discovery Kids: Your Digestive System**  
<http://kids.discovery.com/tell-me/science/body-systems/your-digestive-system>
8. **Enchanted Learning**  
<http://www.enchantedlearning.com/subjects/anatomy/digestive>
9. **Ducksters: Science for Kids**  
[http://www.ducksters.com/science/digestive\\_system.php](http://www.ducksters.com/science/digestive_system.php)
10. **History of the Microscope**  
<http://www.history-of-the-microscope.org/anton-van-leeuwenhoek-microscope-history.php>
11. **Scholastic: Human Body**  
<http://www.scholastic.com/teachers/unit/human-body-everything-you-need>



# The Amazing Human Body

# 1

## ☑ **Lesson Objectives**

---

### **Core Content Objectives**

---

Students will:

- ✓ Identify the five senses and associated body parts
- ✓ Identify the skeletal, muscular, circulatory, nervous, digestive, and excretory systems as important systems in 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 connection between parts of the body and the five senses, as well as the parts of the body and the five major bodily systems in “The Amazing Human Body” (RI.2.3)
- ✓ Interpret information from a chart of the human body to identify various body parts and organs in “The Amazing Human Body” (RI.2.7)
- ✓ Compare and contrast the human body with a machine in “The Amazing Human Body” (RI.2.9)
- ✓ Make personal connections by identifying parts of their own bodies discussed in the read-aloud (W.2.8)
- ✓ Recount a personal experience involving the saying “keep your fingers crossed” with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences (SL.2.4)
- ✓ Explain the meaning of the saying “keep your fingers crossed” and use in appropriate contexts (L.2.6)



## Core Vocabulary

---

**nutrients, n.** Nourishing substances, necessary for growth and the maintenance of life

*Example:* Carbohydrates, proteins, and fats are all important nutrients.

*Variation(s):* nutrient

**nutrition, n.** The process of supplying the body with the proper foods for growth; nourishment

*Example:* Eating junk food does not provide the nutrition needed for healthy human beings.

*Variation(s):* none

**nutritionist, n.** One who studies nutrition, learning what the body needs to live

*Example:* When I was a baby, a nutritionist helped my mother know what foods to feed me so that I would grow into a strong and healthy child.

*Variation(s):* nutritionists

**organs, n.** Body parts that perform specific jobs within body systems

*Example:* Your heart, lungs, and kidneys are examples of organs.

*Variation(s):* organ

**systems, n.** Sets of connected parts that work together to perform a job


*Example:* The digestive and excretory systems both help get rid of bodily waste.

*Variation(s):* system

**vaccinations, n.** The process of getting vaccine treatments to prevent diseases in living things

*Example:* Vaccinations for chickenpox have helped stop the spread of this very contagious disease.

*Variation(s):* vaccination

<b><i>At a Glance</i></b>	<b>Exercise</b>	<b>Materials</b>	<b>Minutes</b>
<b><i>Introducing the Read-Aloud</i></b>	<b>Domain Introduction</b>	Poster 1 (Chart of the Human Body)	10
	<b>What Do We Know?</b>	Poster 1	
	<b>Purpose for Listening</b>		
<b><i>Presenting the Read-Aloud</i></b>	<b>The Amazing Human Body</b>	world map	15
<b><i>Discussing the Read-Aloud</i></b>	<b>Comprehension Questions</b>	Poster 2 (The Human Body Systems)	10
	<b>Word Work: Systems</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<b><i>Extensions</i></b>	<b>Sayings and Phrases: Keep Your Fingers Crossed</b>		5
	<b>Domain-Related Trade Book</b>		15
<b><i>Take-Home Material</i></b>	<b>Family Letter</b>	Instructional Masters 1B-1, 1B-2	*



# The Amazing Human Body

# 1<sub>A</sub>

## Introducing the Read-Aloud

10 minutes

### Domain Introduction

**Note:** Students who participated in the Core Knowledge Language Arts program in Kindergarten and Grade 1 may recall discussing the five senses from *The Five Senses* domain in Kindergarten, and the five major body systems (skeletal, muscular, digestive, circulatory, and nervous) from *The Human Body* domain in Grade 1.

Point to Poster 1 (Chart of the Human Body) and ask students what it depicts. (human body) Ask students to identify anything they recognize on the chart (from body parts to organs) and use one sentence to tell something about it. (for example, “The lungs help us breathe.”) If students have participated in the Core Knowledge Language Arts program in Kindergarten and Grade 1, remind them that they have already learned some things about how the body works, but that they are going to learn much more over the next several weeks.

Ask students to raise their hands if they like to eat. Tell them that what we eat makes a big difference to the health of our bodies. Explain that this domain will focus on the best foods to eat and how the body processes those foods to keep us healthy.

### What Do We Know?

Ask students to guess the meaning of the word *healthy*. (not infected with disease; things that promote or indicate good health) Provide the answer if students do not know. Point to Poster 1. Ask students to name any of the different body systems or parts they can. Ask students to suggest ways these systems help a healthy body. (skeletal system—strong bones; muscular—allows us to move; circulatory—keeps blood flowing through our veins; nervous—communicates with the brain; digestive—keeps nutrients and gets rid of waste; excretory—gets rid of waste)

## Purpose for Listening

---

Tell students they are going to review the functions of these body systems today and learn ways they can help to make sure that their body systems continue to run smoothly. Ask them to listen carefully to find out why the human body is sometimes called the human machine.



### The Amazing Human Body

#### ◀ Show image 1A-1: Nick Nutri presents

Hello, everybody. My name is Nick Nutri, and I am a **nutritionist**. Does anyone know what that means? Nutritionists study **nutrition**, or in other words, the ways in which our bodies get the food they need to grow and stay healthy. Nutritionists learn what is in our food and how our bodies use it. I work with doctors to help children understand what they need to do to take care of their bodies.

One of the first things a nutritionist studies is the human body. It's important to understand how the body works in order to know what it needs to do its job well. Dr. Welbody tells me that you already know a lot about the human body.

Stand up and let's take a look at the body parts that we can see.



#### ◀ Show image 1A-2: Skin is for feeling

Where's your skin? It's all over you, isn't it? Skin covers your head, your face, your neck, your chest, your tummy, your bottom, arms, legs, hands, and feet—everything! Your skin is a stretchy, waterproof covering that protects you from germs and helps control your body temperature. Just beneath your skin are tiny little receptors, part of your nervous system, that travel to your brain.<sup>1</sup> You can't see them, but they tell your brain what is touching your skin and your brain reacts to the touch. Some touches, like petting a dog, can be very positive, while others, like touching a hot stove, can be quite painful.

Touch is one of your five senses. Who can name the other four senses that help you get information about your surroundings?<sup>2</sup> Oh, Dr. Welbody was right. You do know a lot!

1 These receptors or nerve endings react to changes, like heat and cold in the body, and send messages to the brain.

2 [Pause for suggestions: taste, smell, sight, hearing]



← **Show image 1A-3: Nose and mouth are for smelling and tasting**

Touch, taste, smell, sight, and hearing are your five senses. Let's sit down and find out what you already know about your body. Where is your sense of taste located? Right—in your mouth! Your tongue is covered with taste buds that allow you to taste the differences between sweet, salty, bitter, and sour foods. They also warn you of danger from hot foods or other things that may harm your body.

Did you know that your sense of smell is connected to your sense of taste? That's why some things don't taste the same to you when you have a cold. What part of your body is affected the most when you have the sniffles? Yes, your nose! And look how close your nose is to your mouth. It makes sense that they are connected, doesn't it?



← **Show image 1A-4: Eyes are for seeing**

Just above your nose are your eyes. Which of your senses do they control? Sight, of course! Your eyes are responsible for what you see. Vision<sup>3</sup> lets you know the size and shape of an object, how near or far it is, and how fast it is moving. That's a lot of information. Some people have problems seeing correctly, but fortunately they are able to have many of their problems corrected by wearing glasses or contact lenses.

3 or your ability to see



← **Show image 1A-5: Ears are for hearing**

Okay, we've named four of the five senses—touch, taste, smell, and sight. The last one is hearing. What do you use to hear? Your ears, of course! Your ears catch and change sound waves into nerve signals that travel to your brain. Your ears not only help you hear, but they also help you keep your balance. Some people are born deaf,<sup>4</sup> and some others develop deafness later in life. Hearing aids often help them hear better.

4 or unable to hear



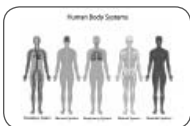
← **Show image 1A-6: We all have bodies**

Look around you. You all have skin. You all have eyes and noses and mouths and ears. But do you all look the same? Certainly not! You may look different on the outside—different colors of skin, hair, and eyes; different heights and weights—but what lies underneath your skin is all pretty much the same.

You have already learned that your body is a collection of many different **systems**,<sup>5</sup> each with its own job to do. Does anyone remember the names of any body systems?<sup>6</sup> What is your skin wrapped around? What gives your body its shape? Your skeleton!

5 or sets of connected parts that work together

6 [Pause for suggestions.]



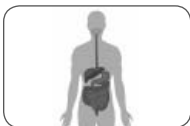
← **Show image 1A-7: The circulatory, nervous, respiratory, skeletal, and muscular systems**

Your skeleton is a part of the skeletal system, including your bones and joints. It supports your body and protects your body's internal, or inside, **organs**.<sup>7</sup> Can you find your ribs? Your tough rib bones cover your soft heart and lungs. Together with your muscular system, your skeletal system helps your body move. The respiratory system is in charge of how your body breathes air into your lungs to supply your body with oxygen. The circulatory system pumps blood from the heart and carries it to all parts of your body. The nervous system is the body's main control center, carrying messages to and from the brain.<sup>8</sup> Do any of these **systems** sound familiar to you?<sup>9</sup>

7 Organs are body parts that do specific jobs for the body, such as the heart, lungs, brain, liver, and so on.

8 The word *nervous*—when it's used to talk about the body's systems—means having to do with nerves. It can also mean worried or anxious, but it does not mean that when we're talking about the nervous system.

9 [Have student volunteers point to the various systems under discussion.]



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

Although all of the body systems are important, the two that interest me the most are the digestive system and the excretory system. That's because they are the ones most responsible for the food that enters and leaves your body. You get **nutrients**<sup>10</sup> from the food you eat, and I want to make sure that your body gets the nutrients it needs. The digestive system carries food to your stomach and small intestines, where it breaks down food into fuel to give the body the energy it needs to live. Food that your body can't

10 or substances that are necessary for your body to grow

digest moves into the large intestine and is released as solid waste. The excretory system removes liquid waste from the body. We are going to talk about these two systems a lot more another day.



11 Do you think the human body is like a machine? If so, how is it like a machine, and how is it different?

← **Show image 1A-9: The human machine**

People often compare the human body to a machine with lots of movable parts working together.<sup>11</sup>



← **Show image 1A-10: The human machine breaks down**

Most of the time your body **systems** work well together but, just like machines, sometimes things break down. Germs may get inside your body and cause illnesses. The body fights off germs within the body, but sometimes the body's defenses are not enough. As a baby, you may have received **vaccinations** to help prevent diseases that were once common among children.<sup>12</sup> Vaccines, or the medicine in a vaccination, are inactive or weakened germs, harmless to people, that are often injected<sup>13</sup> into your body. These dead or weakened germs trick the body into thinking that it is becoming infected, or getting sick, so the body figures out how to fight off that infection. The body then knows how to fight off any infections of that kind in the future. If you were vaccinated against diseases like measles or mumps, you will likely not get those diseases.

12 Vaccinations are often called shots.

13 or pumped



← **Show image 1A-11: Taking care of your body**

The human body is truly an amazing machine. You carry your body with you wherever you go. Whether you are reading, eating, playing ball, or sleeping, your body continues to work to keep you healthy. It is important for you to do your part, too. What are some of the things that you can do to take care of your body?<sup>14</sup>

14 [Pause for suggestions.]

Germs are everywhere. How can you help your body fight off germs? Washing your hands with soap and water is one of the most important things that you can do. Make sure that you wash often, throughout every day and especially before you eat. Clean



15 or keeping a clean body

the rest of your body with regular baths and shampoos, too. Cleanliness<sup>15</sup> is very important to your body's health.

16 What is nutrition again? (providing the body with the food it needs to grow and stay healthy)

How often have you heard an adult say, "Eat your fruits and veggies?" I told you that I am a nutritionist. That means that good nutrition is very important to me.<sup>16</sup> Eating the right foods is important for good health and that means eating lots of fruits and veggies. It is so important that your body gets the proper **nutrients** to keep its marvelous machine running smoothly.



◀ **Show image 1A-12: The importance of exercise**

Exercise goes hand-in-hand with healthy eating. The food you eat supplies your body with the energy it needs to exercise its muscles. By walking, running, and playing ball, you help your body stay lean and fit.

17 like doctors and nurses

Getting enough rest and having regular checkups with health care professionals<sup>17</sup> are both important, as well. In the following lessons, we will talk about all of these things. Taking care of your body is more than just keeping your fingers crossed and hoping you will be healthy. By the time you finish these lessons, you will know a lot of ways you can help your body stay strong and healthy.



◀ **Show image 1A-13: Anton van Leeuwenhoek**

Next time we're together I'm going to tell you about one of my heroes—a man named Anton van Leeuwenhoek [*LAY-van-huke*]. Anton van Leeuwenhoek [*LAY-van-huke*] is from a country called Holland, and he was Dutch, which is what you call someone from Holland, which today is part of the country known as the Netherlands.<sup>18</sup> Anton was named for where he lived in Holland. The name of his street was Lion's Gate and his house stood on the corner. The word for *lion* in Dutch is *leeuw* [*LAY*] and the word for *corner* is *hoek* [*huke*]; thus, his name is Anton who lives on the corner of Lion's Gate. Naming people in such a way was not uncommon when Anton was born, nearly four hundred years ago. I can't wait to tell you why he is my hero, but I'll save that for next time.

18 [Point to the Netherlands on a world map.]

### Comprehension Questions

10 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 students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses.

1. *Inferential* [Point to Poster 2 (The Human Body Systems) to assist students with this question.] What is the name of the body system that processes the food that you eat? (digestive) What is the name of the system that removes liquid waste from your body? (excretory) What are the other body systems? (skeletal, muscular, circulatory, and nervous systems)
2. *Inferential* Why does a nutritionist need to understand the human body? (Answers may vary. Students should understand that the body is a complex machine that needs certain foods for the maintenance of its parts; a nutritionist needs to understand the relationship between the two.)
3. *Inferential* When you eat a sandwich, which body senses do you use, and what are the body parts associated with each sense? (Sight: eyes see the sandwich; smell: nose smells the sandwich; taste: mouth or tongue tastes the sandwich; hearing: ears hear the sandwich being eaten; touch: hands feel the sandwich.)
4. *Inferential* Sometimes when you have a cold, you lose your appetite. What other sense, working together with your sense of taste, could affect your appetite? (sense of smell)
5. *Literal* Many people have their eyes examined by an eye doctor if they have trouble seeing correctly. What might the eye doctor suggest to help them? (He/she might prescribe corrective glasses or contact lenses.)

6. *Literal* Washing your hands is an important way to fight germs, but sometimes doctors inject weakened germs into your body on purpose. Why do they do this and what is it called? (These weakened germs, or vaccines, are not harmful and will protect the body from disease. These injections are called vaccinations.)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

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:* Nick Nutri is a nutritionist. He helps people learn about nutrition, making the right food choices to keep their bodies working well. Do you think this is an important job? Why or why not? (Answers may vary.)
9. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

### Word Work: Systems

5 minutes

1. In the read-aloud you heard, "You have already learned that your body is a collection of many different *systems*, each with its own job to do."
2. Say the word *systems* with me.
3. Systems are sets of interconnecting parts working together.
4. The muscular and skeletal systems work together to help your body move.
5. Which one of the human body systems do you think is the most important? Use the word *system* or *systems* when you tell us why you chose that particular system. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "I think the respiratory system is the most important because . . ."]
6. What's the word we've been talking about?

Use a *Fill-in-the-Blank* activity for follow-up. Directions: I am going to read five sentences, each one describing a different body system. You will have to listen closely for clues and then complete each sentence by filling in the blank with the name of the correct body system.

1. Hundreds of skeletal bones make up the \_\_\_\_\_. (skeletal system)
2. Blood circulates, or travels, through the body as part of the \_\_\_\_\_. (circulatory system)
3. Food is digested, or broken down, in the \_\_\_\_\_. (digestive system)
4. Muscles expand and shrink, working as part of the \_\_\_\_\_. (muscular system)
5. Nerves travel up and down the spinal cord to the brain, the center of the \_\_\_\_\_. (nervous system)



**Complete Remainder of the Lesson Later in the Day**



# The Amazing Human Body

# 1<sub>B</sub>

## Extensions

**20** minutes

### Sayings and Phrases: Keep Your Fingers Crossed

**5** minutes

Proverbs are short, traditional sayings that have been passed along orally from generation to generation. These sayings usually express general truths based on experiences and observations of everyday life. While some proverbs do have literal meanings—that is, they mean exactly what they say—many proverbs have a richer meaning beyond the literal level. It is important to help your students understand the difference between the literal meanings of the words and their implied or figurative meanings.

Ask students if they have ever heard anyone say about an event to “keep your fingers crossed” or “I’m keeping my fingers crossed”? Have students repeat the proverb “keep your fingers crossed.” Explain that this proverb is another way of saying you hope for a good result from some future event.

Ask students if they have ever hoped for good weather for a special event, like field day or some outdoor activity. Tell students that instead of saying, “I hope it doesn’t rain on field day,” they could say, “I’m keeping my fingers crossed that it doesn’t rain on field day.” Give students the opportunity to share their hopes, and encourage them to use the saying.

In today’s read-aloud, Nick Nutri says, “Taking care of your body is more than just keeping your fingers crossed . . .” Ask: “What does Nick Nutri mean when he says this?” (Nick Nutri means that it takes more than luck to keep your body healthy.) Look for more opportunities to use this saying in the classroom.

## **Domain-Related Trade Book**

---

**15** minutes

Refer to the recommended trade books in the Introduction at the front of this Anthology, and choose one that provides a general overview of the human body to read aloud to the class. As you read, pause and ask occasional questions, rapidly clarifying critical vocabulary within the context of the read-aloud, etc. After you finish reading the trade book, lead students in a discussion as to how the information in the book relates to the read-aloud they heard today.

## ***Take-Home Material***

---

### **Family Letter**

---

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



# Anton van Leeuwenhoek

## 2

### ✓ Lesson Objectives

#### Core Content Objectives

Students will:

- ✓ Describe the significant contributions of Anton van Leeuwenhoek

#### 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 connection between the discovery of bacteria and Anton van Leeuwenhoek's use and improvement of the microscope in "Anton van Leeuwenhoek" (RI.2.3)
- ✓ Make personal connections in documenting observations made examining things with a magnifying glass (W.2.8)

#### Core Vocabulary

**bacteria, n.** Very small living things not visible with the naked eye, some of which may cause disease

*Example:* Washing your hands with soap helps prevent harmful bacteria from attacking your body.

*Variation(s):* bacterium

**lens, n.** A curved piece of glass used in magnifying glasses and microscopes

*Example:* Thomas was able to see the tiny veins of the fly's wings when viewed through the lens of the microscope.

*Variation(s):* lenses

**magnifies, v.** Makes something appear larger than it really is  
*Example:* My grandmother's magnifying glass magnifies the print in her book so that she can read more easily.

*Variation(s):* magnify, magnified, magnifying

**microscope, n.** A magnifying instrument used for viewing very small objects


*Example:* The students took turns looking through the microscope to see the ant's antennae.

*Variation(s):* microscopes

**observations, n.** Information gathered by closely watching someone or something

*Example:* Carly watched the birdfeeder, writing down her observations of the birds that came to feed.

*Variation(s):* observation

<b><i>At a Glance</i></b>	<b>Exercise</b>	<b>Materials</b>	<b>Minutes</b>
<b><i>Introducing the Read-Aloud</i></b>	<b>What Do We Know?</b>		10
	<b>Purpose for Listening</b>		
<b><i>Presenting the Read-Aloud</i></b>	<b>Anton van Leeuwenhoek</b>	Image Card 1	15
<b><i>Discussing the Read-Aloud</i></b>	<b>Comprehension Questions</b>		10
	<b>Word Work: Observations</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<b><i>Extensions</i></b>	<b>Using a Magnifying Glass (Hand Lens)</b>	Instructional Master 2B-1; a magnifying glass; a patterned fabric swatch for each student; drawing tools	20
	<b>Under a Microscope</b>	Microscopes or images of microscopic items [This exercise may require advance preparation]	





# Anton van Leeuwenhoek

# 2<sub>A</sub>

## ***Introducing the Read-Aloud***

**10** minutes

### **What Do We Know?**

What country was Anton van Leeuwenhoek from and how long ago was he alive? (Anton was from Holland and he lived four hundred years ago.) What does Anton van Leeuwenhoek's name mean in Dutch? (Anton who lives on the corner of Lion's Gate) What else did Nick Nutri say about Anton? (Anton is one of Nick's heroes.)

### **Purpose for Listening**

Tell students that you are going to give them a hint about why Anton van Leeuwenhoek is Nick Nutri's hero. Tell them that four hundred years ago, Anton made an important discovery that helps present-day scientists like Nick Nutri. Ask them to listen carefully to find out what Anton discovered.



## Anton van Leeuwenhoek

### ◀ Show image 2A-1: Nick Nutri and Leeuwenhoek

Hi, boys and girls. Last time we were together, I said that I would tell you about Anton van Leeuwenhoek [LAY-van-huke] today. I do plan to do that, but first I want to tell you a story about me.

When I was about your age, one day my father came home with a present for me under his arm. When I first opened it, I wasn't sure what it was.



### ◀ Show image 2A-2: Student microscope<sup>1</sup>

It looked like this. Do you know what this is called or what it does? My father explained that it was a **microscope**. That was nothing I had ever dreamed of wanting. I spent most of my time playing outside and could barely sit still to read a book. Why would I want this funny looking-instrument?<sup>2</sup>

"You are so curious about everything. I thought perhaps you'd like to see what a butterfly wing looks like close up," my father said.



### ◀ Show image 2A-3: Butterfly wing under a microscope

I peered through the **lens**<sup>3</sup> of the microscope and saw the tiny veins and hairs of a butterfly's wing. I looked at insect eyes and blades of grass. I looked at oak leaves and dead bumblebees and toy soldiers. It was the best present I had ever received.



### ◀ Show image 2A-4: What does a magnifying glass do?<sup>4</sup>

Have you ever used a magnifying glass? Who can tell me what a magnifying glass is used for? Yes, it **magnifies** objects. It makes objects look hundreds of times larger than they really are. It shows things that are too small to see with the human eye alone. Sometimes people use magnifying glasses to read really small print or to find splinters buried deep in the skin. Well, a microscope is a lot like that but a whole lot better.

1 [If there is a microscope in the classroom, direct students' attention to it.]

2 Who knows what a microscope is? [Pause for students' answers.] A microscope is a type of scientific equipment that uses pieces of curved glass to make very small things look bigger.

3 or curved piece of magnifying glass

4 [Point out to students the magnifying glass in your classroom.]

So, what does that have to do with Anton van Leeuwenhoek? Well, just like me at seven years old, the year I received my first microscope, Anton was very curious. He also had a fascination with magnifying objects. Although Anton was not a scientist, his work with microscopes changed the way people thought about the human body and how it works.



5 or cloth

← **Show image 2A-5: Threads of cloth under a magnifying glass**

At sixteen, Anton began working in the textile<sup>5</sup> business. His shop sold cloth, buttons, sewing supplies, ribbons, and lace. His customers were very particular, expecting the very best textiles, or cloth, for their suits and dresses. Anton used a magnifying glass to make sure the threads of the cloth were straight and tightly woven. His customers appreciated Anton's careful **observations**.<sup>6</sup>

6 Observations are made when you look closely at the details of something.

7 Do you have any ideas of what these images, or pictures, were about?



← **Show image 2A-6: Lice**

When he was about thirty years old, Anton took a trip from his home in Holland to nearby England. There he discovered a book called *Micrographia*, meaning small images.<sup>7</sup>

Written by Robert Hooke, the book was full of drawings and descriptions of objects seen through a microscope. Anton was fascinated by how large and detailed the micro, or small, objects looked when seen through the lenses of a microscope.<sup>8</sup> It was a little like someone with poor eyesight putting on eyeglass lenses for the first time and discovering that the blurry tree in the distance was actually made up of individual leaves. He couldn't wait to get home to experiment with his own objects.

8 or pieces of curved glass that magnified what he could see



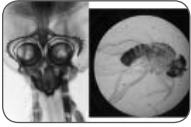
← **Show image 2A-7: Anton's microscope**

Upon his return to Holland, Anton began to build his own single-lens microscopes.<sup>9</sup> He shaped his lenses very carefully, grinding them down with sand and polishing them smooth with putty.<sup>10</sup> Anton's simple microscopes magnified objects from fifty to two hundred times their natural size.

9 or a type of microscope having only one lens

10 or polishing powder

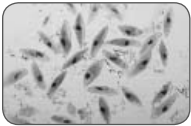
11 Who remembers what insect larvae are? (early stage of insects' life between egg and pupa)



← **Show image 2A-8: Mosquitos under a microscope**

Anton had been interested in science and nature ever since he was a boy, and now he had the opportunity to study nature at a much closer range. He carried squiggly wormlike insect larvae around in his pocket, eager to watch the entire life cycles of insects with the aid of a microscope.<sup>11</sup>

Using the microscopes he made himself, he studied people's skin, mosquito wings, and sheep hairs. He observed duck hearts, fish scales, cow eyes, and water bugs. What a strange man, others thought. But this patient man was driven by his curiosity, and he wanted to learn more. He never lost interest in the scales on a gnat's wing or the hairs on a fly. He looked at the same things again and again—comparing, measuring, and recording his findings.



← **Show image 2A-9: Pond water under a microscope**

Anton conducted many experiments with water—drinking water from his well, water from lakes and from the sea, rain, and melted snow. He discovered what looked to him like tiny “little animals” in lake water. He called these “little animals” animalcules. Anton claimed he saw even more animalcules swimming about in rainwater. They were everywhere, he said. He estimated<sup>12</sup> that one thousand of these tiny creatures could fit on the head of a pin.<sup>13</sup> People called him a liar and a magician, thinking him quite mad.<sup>14</sup>

But, in fact, Anton was not mad at all. His “little animals” were not really animals, but they were definitely alive. He was the first to observe and describe many tiny living things in nature not visible with the naked eye, including **bacteria**, or germs.<sup>15</sup> Many scientists believe that these tiny life forms have been on Earth for more than 3 billion years. They surround us in air, water, and on land, but no one was aware of their existence before Anton recorded what he saw. He discovered a whole new world!

12 or guessed

13 [Show Image Card 1 (Pins).] What do you use a pin for? (sewing) The head of the pin is the flat top part.

14 or crazy

15 When something cannot be seen with the naked eye, it means you can't see the object with just your eyes. You need a tool such as a microscope, telescope, or magnifying glass in order to see it. In other words,



16 or living things



17 or writing book



← **Show image 2A-10: Close-up of a smile**

Ever curious, Anton began studying the saliva from inside his mouth. He discovered even more bacteria. He found that the sticky coating on the outside of his teeth was crawling with millions of tiny organisms.<sup>16</sup> You have them too, but don't worry. They won't hurt you. We'll learn more about them another day.

← **Show image 2A-11: Engraving of Anton from the Royal Society**

Anton kept a journal<sup>17</sup> to record his detailed observations. He made friends with two English doctors who belonged to England's Royal Society of London. They told him that their fellow English scientists kept similar journals to share their scientific discoveries, and they invited Anton to share his work with them. And so, for the next fifty years, Anton sent hundreds of letters to England. His letters described in great detail the tiny structures that he saw through his homemade microscopes. He described fungus on stale bread; the stingers, eyes, and mouths of bees; even tiny lice. Because he could not draw well, Anton hired someone to illustrate his writing. The English society loved everything he sent and published his letters for others to read.

← **Show image 2A-12: A microscope today and Anton's microscope**

Anton van Leeuwenhoek did not invent the microscope, nor was he the first to use one, but he used his own simple microscope more than most people of his day. Compared to modern microscopes, Anton's was very simple indeed. It was even more simple than other microscopes used in his day. The entire instrument was only three to four inches long and had to be held up close to the eye.

Anton's microscope used only one lens. Modern microscopes have two or more lenses—one in the eyepiece that you look through; and at least one lens at the bottom of the tube, or barrel, to enlarge things even more.

Today, objects are put on glass slides to be viewed. These objects remain in one place. It is the lens that moves, not the

objects. Instead of keeping the objects in one place, Anton mounted his objects on the end of a sharp pointed pin sticking up in front of the lens and moved the objects instead of the lens. Anton's invention required good lighting and great patience to use. His lenses were the clearest and most powerful lenses of his day, but he never shared his secret for creating them. No one came close to matching the quality of Anton van Leeuwenhoek's microscopes for more than one hundred years after his death. Of the four to five hundred microscopes that Anton is believed to have made, no more than nine exist today.



◀ **Show image 2A-13: Pond water under a microscope**

Anton is one of my heroes because he was the first person to describe bacteria, tiny living things not visible with the naked eye. And his discovery of bacteria made it possible to see other small living things, such as the small building blocks of all life on Earth. As a nutritionist, I am fascinated by how the human body works and the tiny building blocks that make up the human body. The next time we meet, I look forward to teaching you about the amazing body's amazing building blocks.

## ***Discussing the Read-Aloud***

**15** minutes

### **Comprehension Questions**

**10** 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 students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses.

1. *Literal* What was Anton van Leeuwenhoek's important discovery? (bacteria, tiny living things not visible with the naked eye)
2. *Inferential* What instrument made Anton's discovery possible? How? (He used a microscope with its magnifying lens to magnify drops of water, his own saliva, and many other things.)

3. *Evaluative* If you could choose one word to describe Anton van Leeuwenhoek, what would it be? Why? (Answers may vary. Possibilities include: *curious, patient, hardworking, smart, observant, brave*)
4. *Evaluative* Anton had a name for the living things he saw under his microscope's lens. What did he call these living things? (animalcules or "little animals") Do you think that was a good name? Why or why not? (Answers may vary, but may include that he named them from his own experience, and they probably looked more like animals than anything else he had ever seen.)
5. *Inferential* Anton lived a very long time ago, so how do we know so much about his discoveries? (He kept detailed journals, many of which were published in England.)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

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

6. *Evaluative* Some people say "seeing is believing," meaning they can't believe something exists unless they see it themselves. Before the microscope was discovered, or people had the opportunity to look into a microscope themselves, they didn't believe tiny things impossible to see without a microscope, like bacteria, could exist. Remember how crazy people thought Anton was when he told them about the animalcules? Our microscopes are very powerful now, and we can see many, many things even smaller than bacteria. Do you think it's possible, that there may still be things too small to see even with our powerful microscopes? Do you think "seeing is believing"? Why or why not? (Answers may vary.)
7. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

## Word Work: Observations

5 minutes

1. In the read-aloud you heard, “His customers appreciated Anton’s careful *observations*.”
2. Say the word *observations* with me.
3. Observations include the information that is gathered when watching someone or something very closely.
4. When drawing a flower, Rusty made detailed observations of its petals.
5. Look around the room and make observations about what you see. Tell us about one of your observations. Use the word *observation* or *observations* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students’ responses: “My main observation is that . . . ”]
6. What’s the word we’ve been talking about?

Use a *Making Choices* activity for follow-up. Directions: I am going to read some sentences from the read-aloud. If the sentence describes one of Anton’s observations, say, “That’s an observation.” If it does not describe one of Anton’s observations, say, “That’s not an observation.” Remember to answer in complete sentences.

1. At sixteen, Anton began working in the textile business. (That’s not an observation.)
2. Anton used a magnifying glass to make sure that the threads of the cloth were straight and tightly woven. (That’s an observation.)
3. Anton found that the sticky coating on the outside of his teeth was crawling with millions of tiny organisms. (That’s an observation.)
4. Anton discovered what looked to him like tiny “little animals” in lake water. (That’s an observation.)
5. Anton made friends with two English doctors who belonged to England’s Royal Society of London. (That’s not an observation.)



**Complete Remainder of the Lesson Later in the Day**





# Anton van Leeuwenhoek

# 2<sub>B</sub>

## Extensions

**20** minutes

### Using a Magnifying Glass (Hand Lens)(Instructional Master 2B-1)

Begin by talking about tools that help people experience the world in new ways, referring back to Lesson 1 and the use of hearing aids and glasses. Other items include canes, crutches, wheelchairs, prosthetic limbs, microscopes, telescopes, etc. You may choose to extend this discussion to include bikes, cars, planes, as well as technological tools like cameras and computers.

#### **Observations**

Have students look at an object far away from them, perhaps on the other side of the room. Ask them how they might see the object better without moving closer to it. They may suggest a variety of tools to make the object appear larger—glasses, magnifiers, binoculars, microscopes, and telescopes.

Hand out magnifying glasses, one per student if possible. Tell students what they are, and ask if anyone has ever used one or knows anything about it. Provide a simple explanation of how they work: the lens is curved outward like a dome on both sides (convex). This curved lens makes objects appear larger.

Encourage students to experiment with the magnifying glasses, looking at each other and at objects around the room. Have them look through the lenses with both eyes open and then with one eye closed. Have them hold the lenses at various distances from their eyes to see what works best for them. Students will probably see best with the non-viewing eye closed and with the magnifying glass held five or six inches away from their faces. They should understand that the closer they hold the glass to an object, the larger the object appears.

### ***Draw What You See***

Once students have had the opportunity to experiment with the hand lenses, give each student Instructional Master 2B-1, a fabric swatch, and a pencil. Ask them to make two drawings. On the top part of the page, ask them to draw patterns from their fabric swatches without the aid of the magnifying glasses. When their first drawings are complete, ask them to each select a section of their fabrics to observe more closely. Using their magnifying glasses, draw the magnified view of what they see.

### **Under a Microscope**

---

Set-up several microscopes with various slides showing a variety of objects. Some ideas include slides of skin, onion membrane, an insect, a drop of blood, or pond water. If microscopes are unavailable, present images of these various items as seen under a microscope. Have students view the slides, and then describe what they see either orally, or by writing or drawing about the various items. If students write about or draw what they see, have students share their work with the class.



# Cells and Tissues

## 3

### ☑ **Lesson Objectives**

---

#### **Core Content Objectives**

---

Students will:

- ✓ Explain that all living things are made of microscopic cells
- ✓ Describe the relationship among cells, tissues, organs, and systems

#### **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 connection between cells and tissues in “Cells and Tissues” (RI.2.3)
- ✓ With assistance, categorize and organize facts about cells and tissues to complete an activity that demonstrates the relationship between cells and tissues (W.2.8)
- ✓ Determine the meaning of the multiple-meaning word *tissue* in “Cells and Tissues” (L.2.5a)
- ✓ Identify a new meaning for the word *tissue* and apply it accurately (L.2.5a)

## Core Vocabulary


**cells, *n.*** The smallest units of living things; the body's building blocks  
*Example:* Our bodies are made up of billions of tiny, microscopic cells.  
*Variation(s):* cell

**functions, *n.*** Roles, jobs, or purposes that support particular activities  
*Example:* One of your heart's functions is to pump blood into other parts of your body.  
*Variation(s):* function

**microscopic, *adj.*** Too small to be seen without the aid of a microscope  
*Example:* Microscopic cells were unknown before the invention of the microscope.  
*Variation(s):* none

**stimulus, *n.*** A thing or event that starts actions, feelings, and thoughts; a thing or event that stirs up specific reactions in organs and tissues  
*Example:* The bee stings acted as a stimulus, sending alarm signals through nervous tissues to the brain.  
*Variation(s):* stimuli

**tissue, *n.*** A group of cells that perform the same job in living organisms  
*Example:* Muscle tissue helps our bodies move, allowing us to run and play.  
*Variation(s):* tissues

At a Glance	Exercise	Materials	Minutes
<b>Introducing the Read-Aloud</b>	<b>Essential Background Information or Terms</b>	Image Card 4	10
	<b>Purpose for Listening</b>		
<b>Presenting the Read-Aloud</b>	<b>Cells and Tissues</b>	Image Cards 2, 3	15
<b>Discussing the Read-Aloud</b>	<b>Comprehension Questions</b>		10
	<b>Word Work: Functions</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<b>Extensions</b>	<b>Making Connections: Cells—The Body's Building Blocks</b>	small cubes in four different colors; resealable plastic bags; tubs to hold cubes; tissue paper in four colors matching the cubes; name-recording sheets (one per "tissue group" labeled <i>connective, muscle, nervous, or epithelial</i> ) [This exercise may require advanced preparation.]	20
	<b>Multiple Meaning Word Activity: Tissue</b>	Poster 2M (Tissue)	



# Cells and Tissues

3<sub>A</sub>

## ***Introducing the Read-Aloud***

**10** minutes

### **Essential Background Information or Terms**

Show students Image Card 4 (Human Cell). Ask students if any of them know what they are seeing. Tell them it is a human cell. Explain that cells are the tiny building blocks that make up the human body that Nick Nutri mentioned at the end of the last read-aloud. Tell students that cells are the smallest units of all living things, not just of the human body. Cells are so small they cannot be seen without a microscope. Ask students if they remember what a microscope does. (makes tiny, almost invisible things appear much larger)

Refer students to the name of today's read-aloud, "Cells and Tissues." Tell them they are going to learn about cells and groups of cells. These groups of cells are called tissues.

### **Purpose for Listening**

Ask them to listen carefully to find out the relationship between cells and tissues in the human body, as well as about the four different types of tissues in the human body.

## Cells and Tissues

Today we are going to talk about **cells**. When you hear the word *cell*, what is the first thing that comes to your mind?



◀ **Show image 3A-1: Nick Nutri holding a cell phone**

It may be that you think of a cell phone like this. Telephone companies divide cities, towns, and countrysides into lots of separate areas in order to provide the best service. Each area is called a cell. That's why mobile<sup>1</sup> phones are called cell phones. They use signals from lots of different cells.

1 or moveable

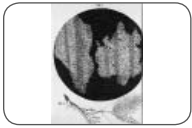
What do you remember about the hives of honeybees?<sup>2</sup> Their hives are made up of lots of different areas called cells, too. Different activities occur in each cell. Another example that might help us understand cells would be a large multi-floor school building that has many classrooms. A teacher is in each classroom, similar to cells lined up one after the other inside beehives. The word *cell* describes one of many small parts that form a much larger area. One classroom is like one cell of many cells or rooms in a school, like a honeybee's cell is one of many cells in a hive.<sup>3</sup>

2 [Show Image Card 2 (Bee Hive).]

3 But unlike the cells of a beehive, the cells of living things are too small to be seen without the aid of a microscope.

Because you're learning about the human body, you may have guessed that we're not going to be talking about cell phones or honeybees today! Instead, we will focus on human body cells. These cells were a mystery to people for thousands of years. No one even knew they existed. The invention of the microscope changed all of that. Microscopes magnify cells, making them big enough for the human eye to see.

Last time, I mentioned a man whose book of **microscopic** organisms, or living things, influenced the work of Anton van Leeuwenhoek.



← **Show image 3A-2: A view of Hooke's cork cells**

The man was an Englishman named Robert Hooke. In one of Hooke's first experiments with a microscope, he sliced open the stem of a cork plant and placed it under his lens.<sup>4</sup> What he saw amazed him. The cork was made up of tiny walled spaces. These little boxes reminded him of the cells in a honeycomb. Hooke was the first to use the term *cell* to describe what he saw through the microscope. We still use the word *cell* today when referring to these tiny little boxes of which all living things, both plants and animals, are made.

4 [Show Image Card 3 (Cork Tree and Cork Board).] You are probably familiar with corkboards or bulletin boards made with cork. Cork comes from cork trees.



← **Show image 3A-3: Giraffe with an oxpecker**

All living things, no matter how big or how small, are made up of microscopic units called cells. Cells are the body's building blocks, the smallest units of life that can carry out the **functions**<sup>5</sup> of a living thing. They are so small that they cannot be seen without the aid of a microscope. That is why we call them microscopic.<sup>6</sup>

The bacteria that Anton van Leeuwenhoek discovered are one-celled organisms, but most living things on Earth have more than one cell. In fact, some have billions of cells. You are one of those creatures. *You* have millions and billions, maybe even trillions, of cells.

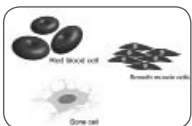
5 or jobs

6 Who remembers what *microscopic* means? (can only be seen using a microscope)



← **Show image 3A-4 Cell division**

You began life as a single cell formed by the joining of two cells, one cell from your mother and one cell from your father. Your parents' two cells merged, and become one joint cell, called a fertilized egg. Then, that one cell divided into two cells that divided into two more. The cells divided again and again until pretty soon there were billions of cells. Your whole body is made up of these tiny building blocks.

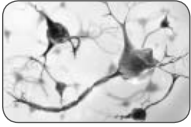


← **Show image 3A-5: Bone, skin, and muscle cells**

The human body is a collection of more than two hundred different types of cells. Cells come in all shapes and sizes, depending upon the jobs<sup>7</sup> they must perform. Bone cells build bone. Skin cells build skin. And muscle cells build your muscles.

7 or functions

8 What are nutrients?



9 [Point to image 3A-6 and the branches of the nerves.]

10 Factories are buildings or places where things are made. Some examples are toy factories, book factories, car factories, and so on.

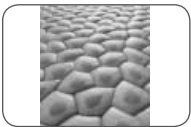
The shape of a cell usually reflects the role it plays in the day-to-day working of the human body. For example, red blood cells are shaped somewhat like shallow bowls. Just like bowls that can be used to hold things like cereal, milk, or ice cream, the bowl-shaped red blood cells hold and carry nutrients through your blood.<sup>8</sup>

← **Show image 3A-6: Nerve cell**

Nerve cells have really long tails to send and receive messages quickly. See all the little branches on this nerve cell?<sup>9</sup>

Cells are like tiny chemical factories.<sup>10</sup> Because they are living organisms, they need nutrients and air to stay alive. Your heart pumps blood to cells throughout your body, carrying food and oxygen to each cell. Your cells use these nutrients to form muscles, nerves, skin, and bone, and to help protect your body from disease.

Living things do not last forever. Body cells have limited lives. Some cells get damaged when you get hurt. Others wear out over time. As cells die, the dead cells are replaced with new cells on a daily basis. Isn't that amazing?



11 or dividing line

← **Show image 3A-7: Microscopic section of skin**

Let's look closely at a microscopic section of skin. Skin cells are packed tightly together to form a protective boundary<sup>11</sup> between you and your environment. Do you see the layers of cells, stacked one on top of the other? The old, dead cells flake off and form a protective layer for the new cells that are constantly growing beneath. They grow, split, make new cells, and die. Some cells live for only a few days. Others live for years.

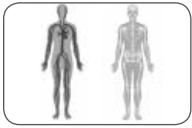
12 What does *function* mean? (job or purpose)

13 *Tissue* can also be a piece of soft and very thin paper that is used especially for cleaning.

Cells work together. They are organized into groups of cells that all perform the same function.<sup>12</sup> These groups of cells are called **tissue**. Tissue is a collection of the same kinds of cells working together to do the same job.<sup>13</sup>

There are four main types of tissue, and each type serves a different function. The four types of tissue are connective, muscle, nervous, and epithelial [ep-uh-*THEE*-lee-uhl].





← **Show image 3A-8: Skeleton and circulatory system**

What do you think connective tissue does? It connects. Connective tissue supports the body and binds other tissue together like glue. Your skeleton is made up of bone, a connective tissue that provides the structure or framework for your body. It contains cells that make the tissue strong and flexible.<sup>14</sup> Fat is a connective tissue, padding your body and supplying it with energy. You may be surprised to learn that blood is also a connective tissue, but think about it. This liquid tissue flows throughout your entire body and connects all of its many parts.

14 or able to bend easily without breaking

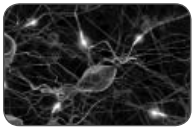


← **Show image 3A-9: Muscle tissue**

Muscle tissue helps your body move. It is the softest and most abundant tissue in your body.<sup>15</sup> There are different kinds of muscle tissue. Your stomach walls are lined with smooth muscle tissue that helps digest your food. You would not be alive without cardiac muscle tissue. What does the cardiac muscle do? It is found only in your heart, and its job is to pump your blood. Skeletal muscle tissue moves your bones. The long, thin strands of muscle tissue stretch and shrink in response to messages from your brain. As they shorten, they move the parts of your body.

15 [Point to the image.] You can see how much muscle tissue there is throughout the whole human body.

So, connective tissue connects and muscle tissue moves your body parts.

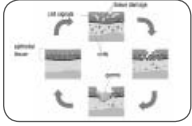


← **Show image 3A-10: Nervous tissue**

The third type of body tissue is nervous tissue. Maybe you can figure out what it does based on its name. What does it do? Nervous tissue runs through your body and connects to your brain. Nervous tissue serves as the messengers between your brain and body. Nerve cells within the nervous tissue sense a **stimulus** and carry electrical signals to and from the brain.<sup>16</sup> Nervous tissue acts as the body's most important communication system. One example of how nervous tissue works would be when you touch something that is so hot you would burn yourself. Your nervous tissue receives the stimulus of extreme heat, the message

16 A stimulus is a thing that starts other actions. Examples of a stimulus include a light, a sound, a touch, etc.

is sent to your brain, and your brain sends a message back to the nervous tissue to tell your muscle tissue to jerk your hand away from the hot stimulus. This happens almost automatically without you having to think about it.



← **Show image 3A-11: Bacteria repelled by epithelial tissue**

What on Earth do you think epithelial tissue does? Can you even pronounce that word? Try it. Ep-uh-*THEE*-lee-uhl. What a big word for tissue that covers and protects! Sheets of cells, packed closely together, make up epithelial tissue. Does this picture look familiar? Remember, those are the skin cells that form the outer layer of your skin. You're looking at the epithelial tissue that prevents bacteria from entering your body. This thin, tough covering protects your body and its organs. Epithelial tissue is also found inside your body. It forms barriers to protect the inside of your mouth, nose, throat, and stomach.



← **Show image 3A-12: Cells, tissue, and ?**

Everything you do, from breathing to eating to running, requires lots of working cells. They are truly the building blocks of your body. Cells are organized into tissues, grouped by the similar jobs that they do. Tissues are organized into groups that work together to do similar jobs as well. You will learn all about these groups of tissues the next time we're together.

### Comprehension Questions

10 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 students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses.

1. *Literal* What is the smallest microscopic building block of all living things? (a cell) What is a group of the same cells that perform the same job called? (tissue)
2. *Literal* Name all four types of body tissue. (connective, muscle, nervous, and epithelial)
3. *Literal* Your blood is a tissue, made up of many cells. What type of tissue is blood? (connective) Why? (It connects all parts of your body.)
4. *Inferential* Whenever you hear the word *cardiac* you may safely guess that it has something to do with the heart. Therefore, where is cardiac muscle tissue located? (in the heart)
5. *Literal* Why are cells called microscopic? (They are too small to be seen without the aid of a microscope.)
6. *Inferential* How do we know that cells are alive? (Just like other living organisms, cells need nutrients and air. They grow, split, make new cells, and die.)
7. *Inferential* What is the name of the body tissue that protects? (epithelial) Name some parts of the body where epithelial, or protective, tissue is found. (on your skin and inside your mouth, nose, throat, and stomach)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

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:* Nerve cells form nervous tissue. You have already learned about the nervous system. Where do you think nerve cells and nervous tissues are found? (Answers may vary, but help students understand that nerves are located all over the body. The nervous system is the body's highway of communication.)
9. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

### **Word Work: Functions**

**5 minutes**

1. In the read-aloud you heard, "Cells are the body's building blocks, the smallest units of life that can carry out the *functions* of a living thing."
2. Say the word *functions* with me.
3. Functions are the roles, jobs, or purposes that support particular activities.
4. Some of the functions that trees provide are: releasing oxygen to the air we breathe, giving shade and cooling, serving as a habitat for animals, and supplying the resource of wood.
5. Think of some functions that schools serve. Tell us about one of them. Use the word *functions* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "Schools serve many functions, including . . ."]
6. What's the word we've been talking about?

Use a *True-False* activity for follow-up. Directions: I am going to read some sentences about the functions of different human body systems. If what I read describes one of the body system's functions correctly, say, "That's one of its functions." If it does not describe one of the body system's functions, say, "That's not one of its functions." Remember to answer in complete sentences.

1. The circulatory system circulates blood through the heart to every part of the body. (That's one of its functions.)
2. The nervous system gets rid of our body waste. (That's not one of its functions.) Ask, "What is one of its functions?" (The nervous system sends messages back and forth between the body and the brain.)
3. The respiratory system helps you digest your food. (That's not one of its functions.) Ask, "What is one of its functions?" (The respiratory system is in charge of how your body breathes air into your lungs to supply your body with oxygen.)
4. The skeletal system supports your body and gives it shape. (That's one of its functions.)
5. The digestive system breaks down food into nutrients that your body can use. (That's one of its functions.)



**Complete Remainder of the Lesson Later in the Day**



# Cells and Tissues

3<sub>B</sub>

## Extensions

20 minutes

### Making Connections: Cells—The Body's Building Blocks

Divide the class into groups of four. Give each group a tub of colored cubes, and explain that each cube represents a cell, one of the body's building blocks. Ask students to sort the cubes by color, i.e., one student will collect all the yellow cubes, another will collect all the blue cubes, etc. Have students put their single-colored cubes into plastic, resealable bags.

Once each group has completed the sorting task, ask them to regroup, taking their bags of cubes with them. All of the students with yellow cubes will form one group; all of the students with blue cubes will form another group; etc. There should now be a total of four groups. Ask students to put their cubes in tubs of like colors.

Show students the tissue paper and ask them what this type of paper is called.

Emphasize that groups of individual cells form tissue. Discuss that similar body cells form body tissue to carry out the same body functions. Explain to students that their cells (blocks) were combined to make tissue (the tubs of like-colored blocks).

Review the four types of body tissue (connective, muscle, nervous, and epithelial), and assign a different type of tissue to each group. For example, yellow may represent the epithelial tissue; blue may represent muscle tissue; etc. Distribute the color-coded tissue paper to each group, and ask them to keep the unopened sheets of tissue paper with their blocks in the middle of the table. At the same time, give each group the appropriate name-recording sheet so that you can keep track of who belongs in each group.

Tell students that next time they will combine some tissue to make body organs.

## ↔ Multiple Meaning Word Activity

---

### ***Multiple Choice: Tissue***

[Have students hold up one or two fingers to indicate which image on the poster shows this meaning.]

6. [Show Poster 2M (Tissue).] In the read-aloud you heard, “Tissue is a collection of the same kinds of cells working together to do the same job.” Which picture of *tissue* matches the way *tissue* is used in the lesson? (one)
7. *Tissue* can also mean other things, such as a piece of soft and very thin paper that is used especially for cleaning. Which picture matches this description of *tissue*? (two)
8. Now with your neighbor, quiz each other on the different meanings of the word. Remember to be as descriptive as possible and use complete sentences. For example, you could say, “I keep a tissue in my backpack in case I need to wipe my nose when I’m at school.” And your neighbor should respond, “That’s two.”



# Organs

# 4

## ☑ Lesson Objectives

### Core Content Objectives

Students will:

- ✓ Describe the relationship among cells, tissues, organs, and systems

### 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 connection among cells, tissues, and organs in “Organs” (RI.2.3)
- ✓ Interpret information from a model of a cross-section of the stomach to demonstrate the relationship among cells, tissues, and organs in “Organs” (RI.2.7)
- ✓ With assistance, categorize and organize facts about cells, tissues, and organs to construct a paper model of the tissues that comprise the stomach (W.2.8)

### Core Vocabulary

**collapse, v.** To fall or cave in

*Example:* The little pig who built the house of bricks knew the wolf would not be able to collapse his house no matter how much the wolf huffed and puffed.

*Variation(s):* collapses, collapsed, collapsing


**kidneys, n.** A pair of abdominal organs that helps clean the body’s blood

*Example:* Our bodies’ kidneys are shaped very much like small red beans called kidney beans.

*Variation(s):* kidney



- liver, n.** A large body organ that secretes juices to aid in digestion  
*Example:* Your liver works closely with other organs in your abdomen to break down food as part of the digestive process.  
*Variation(s):* livers
- nourish, v.** Provide with food or other substances necessary for growth  
*Example:* Mothers nourish their babies with milk for the first few months of life.  
*Variation(s):* nourishes, nourished, nourishing
- transplant, v.** To move something from one place to another place  
*Example:* The gardeners transplant the rose bushes from the front yard to the back yard.  
*Variation(s):* transplants, transplanted, transplanting

<b><i>At a Glance</i></b>	<b>Exercise</b>	<b>Materials</b>	<b>Minutes</b>
<b><i>Introducing the Read-Aloud</i></b>	<b>What Have We Already Learned?</b>	Image Cards 4, 5	10
	<b>What Do We Already Know?</b>	Image Card 7	
	<b>Purpose for Listening</b>		
<b><i>Presenting the Read-Aloud</i></b>	<b>Organs</b>	Poster 3 (Cells, Tissues, Organs, Systems)	15
<b><i>Discussing the Read-Aloud</i></b>	<b>Comprehension Questions</b>		10
	<b>Word Work: Nourish</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<b><i>Extensions</i></b>	<b>Making Connections: Tissues Form Organs</b>	Instructional Master 4B-1; small cubes in four different colors; tubs to hold the cubes; resealable plastic bags; tissue paper in four colors matching the cubes; name-recording sheets (one per “tissue group” labeled <i>connective</i> , <i>muscle</i> , <i>nervous</i> , or <i>epithelial</i> ); glue or tape; scissors; drawing tools [This exercise may require advance preparation.	20



# Organs

4<sub>A</sub>

## ***Introducing the Read-Aloud***

**10** minutes

### **What Have We Already Learned?**

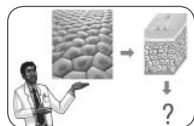
What are the smallest building blocks of all life? (cells) Show students Image Card 4 (Human Cell). What is shown in this image? (human cell) What are groups of cells that perform the same job called? (tissue) Show students Image Card 5 (Muscle Tissue). What is shown in this image? (muscle tissue)

### **What Do We Already Know?**

Show students Image Card 7 (Human Heart). Point to the image of the heart, and ask students if they recognize it. Tell them it is one of the most important organs in their bodies. It is the heart. A person cannot live for very long when the heart stops functioning.

### **Purpose for Listening**

Tell students that so far they have learned that cells form tissue, and that today they are going to hear about what tissue forms. Ask students to listen carefully to find what comes next.



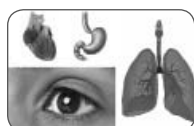
## Organs

- ← Show image 4A-1: Nick Nutri showing photos of the progression of cells, tissues, and ?<sup>1</sup>

- 1 [Review the progression with students and ask them to predict what will be the next category in this progression.]

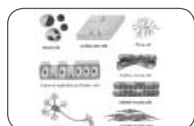
In the last read-aloud you learned about cells and tissues. Similar cells join together in groups to form tissues. In the same way, similar tissues join together to form organs. Organs are parts of the human body that perform special jobs for the body. Organs are made up of groups of tissues. All organs are made up of different kinds of tissues that help them do their jobs well.

Can anyone name one of your body organs?



- ← Show image 4A-2: Eye, heart, lungs, and stomach

Your eyes and ears are organs. Your heart and lungs are organs. Your stomach is an organ, too. Which of your body organs is the largest? It's your skin! Does that surprise you? You've looked at skin cells through the microscope, and we've talked about the epithelial tissue that these cells form. So, while it may seem odd to think of skin as an organ, it does make sense, doesn't it? Strong epithelial tissue, also made up of tiny cells, forms an organ with a very large protective covering, the skin.



- ← Show image 4A-3: Four types of tissue (epithelial, connective, muscle, and nervous tissue)

You've learned about four different types of body tissues. What are the names of all four types of body tissues? One is epithelial, the tissue that forms your skin. What are the other three? The other three are connective, muscle, and nervous tissue. Each different type of tissue is made up of similar cells that do the same jobs. All body tissues are made up of cells. And all body organs are made up of tissues. Cells. Tissues. Organs.<sup>2</sup>

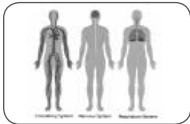
The systems of the human body are organ systems.<sup>3</sup> An organ is a part of the body with a clearly defined function, or job, to perform. Most organs are involved in just one body system. There are ten major organ systems in the human body.

- 2 [Illustrate this concept for your students by drawing three concentric circles. On the innermost circle, write the word *cells*. On the middle circle, write the word *tissues*. And on the outer circle write the word *organs*.]
- 3 What are *systems*? (sets of connected parts that work together to perform a job)



← **Show image 4A-4: Skeleton system and muscular system**

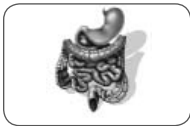
What body systems are in charge of helping you move? Last year, you learned about the skeletal and muscular systems. Your skeletal system is made up of bones and other organs. Its skeletal tissues work together with the smooth muscle tissues in your muscular system to make your body move.



← **Show image 4A-5: Circulatory system, respiratory system, and nervous system**

What does the circulatory system do? It circulates, or moves, your blood around to all parts of your body.

Your heart and blood, made up of cells and tissues, are the organs of your circulatory system. The respiratory system includes your lungs—organs made up of cells and tissues—that control your breathing. What does the nervous system do? It sends messages along the spinal cord to the brain. These two organs, the spinal cord and the brain, are both made up of nervous tissues, full of tiny nerve cells.



← **Show image 4A-6: Digestive system**

Which organ system includes your stomach? Yes, it is the digestive system. Your stomach works closely with other organs, each made up of different types of tissues and different types of cells to perform different types of jobs. Soon, you will be able to name all of the other organs that work together with your stomach to help digest, or break down, your food.

Sometimes your organs are a combination of different types of tissue.<sup>4</sup> The stomach is one of those organs. It is made up of many layers, including all four main types of tissue. These tissues play a very important role in the digestion of your food. We'll take a quick peek at part of your digestive system now. Let's look at the inside of your stomach to see where these four types of stomach tissue live.

4 [You may want to review all four again—connective, muscle, nervous, epithelial.]



← **Show image 4A-7: Cross-section of the stomach**

- 5 [Point to the relevant layers in the image as you read about them, moving from the inside of the stomach outward.]
- 6 What are nutrients? (nourishing substances, necessary for growth and the maintenance of life)

From inside to outside, the first layer of tissue that you see is epithelial tissue.<sup>5</sup> Remember what epithelial tissue does? It is tightly packed, arranged in a layered sheet to cover and protect the organ. Beneath the epithelial tissue is connective tissue, primarily blood that carries—or connects—nutrients to the cells.<sup>6</sup> Smooth muscle tissue lies underneath the connective tissue and helps to move food around in the stomach. Stomach muscles squeeze together about three times per minute, continuing to squeeze whether there is food in your stomach or not. It is the squeezing of these muscles that produces the loud rumbling noise you sometimes hear when your stomach is nearly empty. The fourth type of body tissue, nervous tissue, is located in the stomach wall. It constantly sends signals to the brain and makes sure that all other parts are working smoothly.

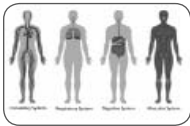
Every organ in your body depends upon other organs to work in the right way. When you study the digestive system more thoroughly in the next lesson, you will see that the stomach could not perform the job of the entire system on its own. It needs help.



← **Show image 4A-8: Nick Nutri pointing out the liver**

Have you ever heard of the **liver**? Your liver is an organ located above your stomach that your stomach depends upon to do its job. Together with two other organs, known as the pancreas and the gallbladder, the liver produces digestive juices to help break down your food. Your liver is one of the largest organs of the body, working as part of several different systems to perform different body functions. You cannot live without your liver. Next time, you will learn more about the very important role that the liver plays in the digestive system.

Organs depend on one another. So do the body's systems. Each system depends upon the other systems to make sure that your body works properly.



◀ **Show image 4A-9: The circulatory, respiratory, digestive, and muscular systems**

For example, blood is carried to all parts of your body through the circulatory system. The circulatory system depends upon the respiratory system to get oxygen into the bloodstream. Your blood would have no nutrients in it without the help of the digestive system to break down your food. Working together, these different systems provide your cells with the food and oxygen they need so that energy can be supplied to all your other systems. Without energy, your muscles couldn't move your bones; without energy, your brain could not think.

When organs stop working properly, body systems break down. The body stops functioning well and you become ill. If your lungs **collapse**,<sup>7</sup> there is not enough oxygen to feed, or **nourish**, your cells with the things they need to live and grow. If your heart stops, it will no longer pump blood with the necessary nutrients to other parts of your body. When you're doing things like riding your bike, or playing certain sports, it's very important to protect your head by wearing a helmet. A head injury might result in damage to your brain, and this might prevent messages from going back and forth between the brain, the nervous system, and other parts of your body.

7 or cave in

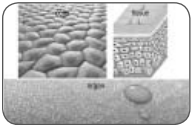


◀ **Show image 4A-10: Kidneys**

A donor is a person who donates, or gives, something. Have you ever heard of an organ donor? Believe it or not, an organ donor gives away an organ to save another person's life. Fortunately, modern science has made it possible to replace damaged organs.

Sometimes when people are very ill, but still have healthy body organs, they decide to donate their healthy organs to others when they die. Sometimes it is even possible for people to spare an organ and go on living healthy lives themselves. For example, you have two **kidneys**. Kidneys are a pair of organs located in your

lower back. You will learn more about these two very important organs, in another lesson. Your kidneys clean poisonous waste from the blood flowing through the body, preventing many different types of disease. You can live a healthy life with only one kidney, so this is one organ that can be donated to someone who needs a kidney. Doctors today can take a kidney from one person's body and **transplant**, or move it into another person's body to keep him or her alive. Doesn't that sound like a miracle? I think so.



8 [Point to image and Poster 3 (Cells, Tissues, Organs, Systems). Show students the progression.]

◀ **Show image 4A-11: Progression: Cells, tissue, organ**

Cells. Tissues. Organs. Systems.<sup>8</sup> The human body is organized into four different levels. Cells are the building blocks of the body. Without cells, there would be no body tissue, no body organs, and no body systems. In fact, without cells there would not be a single living person or thing on Earth!



◀ **Show image 4A-12: Nick Nutri pointing out the digestive system**

The next time we gather together, we'll discuss the organs that work together to digest, or break down, your food. Today we looked inside your stomach, but your stomach is only one part of the food's journey as it travels through your body.

Can you name any of the organs that belong to the digestive system?<sup>9</sup> Great suggestions. With your help, we'll put that puzzle together soon. See you next time.

9 [Pause for suggestions.]

### Comprehension Questions

10 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 students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses.

1. *Literal* Name one of the important body organs that you heard about today. (Answers may include: eyes, ears, heart, lungs, stomach, skin, bones, heart, spinal cord, brain, liver, pancreas, gallbladder, kidneys.) [When students name an organ, ask if they know its function.]
2. *Inferential* The heart, skin, and bones are all organs. What does that tell you about the size, shape, and texture of body organs? (They are all different. No two organs are the same.)
3. *Literal* Cells group together to form tissues; tissues group together to form organs. What do groups of organs form? (systems)
4. *Literal* Give some examples of organs, and the body system the organ belongs to. (Answers may vary. Most organs are involved in just one body system, but there are some exceptions.)
5. *Inferential* You heard today that your eyes and ears and skin are all organs. They are not parts of major organ systems, but they are grouped together as sense organs, and they work closely with the nervous system. You already know about your five senses. Which ones control smell and taste? (nose and tongue)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]



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

6. *Evaluative Think Pair Share:* You learned that people donate, or give away, organs to save other people's lives. Some organs are easier to transplant, or move, than others. Which organs would be very hard to donate and why? (Answers may vary, but may include the skin or the brain.)
7. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

### **Word Work: Nourish**

**5 minutes**

1. In the read-aloud you heard, "If your lungs collapse, there is not enough oxygen to feed, or *nourish*, your cells with the things they need to live and grow."
2. Say the word *nourish* with me.
3. *Nourish* means to provide with food or other substances necessary for growth.
4. The school cafeteria provides a variety of foods that help nourish our growing bodies.
5. Think of one of your favorite foods (drinks) that you eat (drink) to nourish your body. Use the word *nourish* when you tell us about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "I nourish my body by eating (drinking) . . . "]
6. What's the word we've been talking about? What part of speech is the word *nourish*?

Use a *Making Choices* activity for follow-up. Directions: I am going to name some foods and drinks. If it is a food or drink with nutrients that will nourish your body, say, “That will nourish me.” If it is not a food or drink that will nourish your body, say, “That will not nourish me.” Remember to answer in complete sentences.

1. soda (That will not nourish me.)
2. eggs (That will nourish me.)
3. jelly beans (That will not nourish me.)
4. black beans (That will nourish me.)
5. squash (That will nourish me.)



**Complete Remainder of the Lesson Later in the Day**



# Organs

4<sub>B</sub>

## Extensions

20 minutes

### Making Connections: Tissues Form Organs (Instructional Master 4B-1)

Ask students to find their respective tissue groups from last time and sit together with their tubs—connective tissue together, epithelial tissue together, etc.



#### ◀ Show image 4A-7: Cross-section of a stomach

Ask students to listen as you reread the following section from the read-aloud:

*Sometimes your organs are a combination of different types of tissue. The stomach is one of those organs. It is made up of many layers, including all four main types of tissue. These tissues play a very important role in the digestion of your food. We'll take a quick peek at part of your digestive system now. Let's look at the inside of your stomach to see where these four types of stomach tissue live.*

*From inside to outside, the first layer of tissue that you see is epithelial tissue. Remember what epithelial tissue does? It is tightly packed, arranged in a layered sheet to cover and protect the organ. Beneath the epithelial tissue is connective tissue, primarily blood that carries—or connects—nutrients to the cells. Smooth muscle tissue lies underneath the connective tissue and helps to move food around in the stomach. Stomach muscles squeeze together about three times per minute, continuing to squeeze whether there is food in your stomach or not. It is the squeezing of these muscles that produces the loud rumbling noise you sometimes hear when your stomach is nearly empty. The fourth type of body tissue, nervous tissue, is located in the stomach wall, constantly sending signals to the brain and making sure that all other parts are working smoothly.*

Ask each student to take a piece of tissue paper. Then, tell them that they are now going to regroup again. Have them count off—1, 2, 3, 4—so that

all ones form a group, all twos form a group, etc. All four colors of tissue paper should now be represented in each newly formed group.

Each table should be supplied with glue or tape, scissors, and colored pencils (at least one of each of the four corresponding tissue colors). Tell students to put their tissue paper into the middle of the table so that they can use it collectively.

Give each student a copy of Instructional Master 4B-1. Tell them that they are going to complete the drawing of the stomach by filling in its different types of tissue.

Ask each student to take a piece of epithelial tissue from the center of the table; e.g., if yellow represents epithelial tissue, each student should take a piece of yellow tissue paper. Ask them where they think it will go. Then, reread:

*From inside to outside, the first layer of tissue that you see is epithelial tissue. Remember what epithelial tissue does? It is tightly packed, arranged in a layered sheet to cover and protect the organ.*

Have students glue or tape the epithelial tissue in the center and work their way out to the stomach wall with subsequent tissues, following the same procedures as outlined above—reading from the text and making sure they have the correct color tissue each time.

Once each student has applied all four types of tissue to the stomach, have students use a colored pencil to highlight each of the four words at the bottom of the page (epithelial will be highlighted in yellow, etc.) following the same color-coding as before.



# Pausing Point

PP

## **Note to Teacher**

---

You should pause here and spend one day reviewing, reinforcing, or extending the material taught thus far.

You may have students do any combination of the activities listed below, but it is highly recommended you use the Mid-Domain Student Performance Task Assessment to assess students' knowledge of body systems and their organizational levels, including cells, tissues, and organs. The other activities may be done in any order. 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 Objectives Up to This Pausing Point**

---

Students will:

- ✓ Identify the five senses and associated body parts
- ✓ Identify the skeletal, muscular, circulatory, nervous, digestive, and excretory systems as important systems in the human body
- ✓ Describe the significant contributions of Anton van Leeuwenhoek
- ✓ Explain that all living things are made of microscopic cells
- ✓ Describe the relationship among cells, tissues, organs, and systems

## **Student Performance Task Assessments**

---

### **10 Cells, Tissues, Organs, and Systems**

---

#### **Materials: Instructional Master PP-1**

Use Instructional Master PP-1 to identify Anton van Leeuwenhoek's discovery and to assess students' knowledge of the relationship among cells, tissues, organs, and systems. Read

each sentence to students, as well as the word choices in the word bank, to ensure understanding. Repeat as needed.

## Activities

---

### Riddles for Core Content

---

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

- I am one of your sense organs, the largest body organ. What am I? (skin)
- I am the system responsible for circulating, or moving, blood to all other systems. What am I? (circulatory system)
- I am an instrument used to view microscopic organisms. What am I? (microscope)
- I am the system responsible for carrying oxygen to your lungs so that you can respire, or breathe. What am I? (respiratory system)
- I work with your sense of taste to make eating pleasurable for you. What am I? (sense of smell)
- I am one of the body's building blocks, the smallest unit of life that can carry out functions of living things. What am I? (cell)
- I am a curved piece of glass used to magnify objects on a microscope. What am I? (lens)
- I am the softest and most abundant tissue in the human body. What am I? (muscle tissue)
- I am a tiny, one-celled organism that Anton van Leeuwenhoek discovered when looking at water through a microscope. What am I? (bacteria)
- I am made up of body tissues, groups of similar cells. What am I? (an organ)
- I may live for a very short time, but when I die your body will replace me. What am I? (a cell)

## Image Review

---

You may show the Flip Book images from any read-aloud again and have students retell the read-aloud using the images.

## Image Card Review

---

### Materials: Image Cards 1–7

Hold Image Cards 1–7 in your hand, 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 say a clue about the picture s/he is holding. For example, for tissues, a student may say that it is a group of similar cells. The rest of the class will guess what is being described. Proceed to another card when the correct answer has been given.

## Cells, Tissues, Organs Image Cards Sequencing Activity

---

### Materials: Image Cards 4–6

Hold Image Cards 4–6 in your hand, fanned out like a deck of cards. Ask three students to choose one card and hold it over his/her head so the rest of the class can see the card. Place the students in order from left to right: cells, to tissues, to organs.

## Domain-Related Trade Book or Student Choice

---

### Materials: Trade book

Read a trade book to review concepts covered thus far in this domain; refer to the books listed in the Introduction. You may also choose to have students select a read-aloud to be heard again.

## Key Vocabulary Brainstorming

---

### Materials: Chart Paper, chalkboard, or whiteboard

Give students a key vocabulary word such as *microscope*. Have them brainstorm everything that comes to mind when they hear the word, such as “Anton van Leeuwenhoek made his own microscopes,” etc. Record their responses on a piece of chart paper, a chalkboard, or a whiteboard for easy reference.

### Guest Presenter

---

Invite a scientist or science teacher to bring a microscope to class and demonstrate its use. Have them answer questions about the lenses and permit students to examine various things.

### An Audio-Visual Biography of Anton van Leeuwenhoek

---

**Materials: Internet connection; audio/visual equipment [May require advance preparation if needed equipment is not already present in the classroom.]**

Present a short, informative biography of van Leeuwenhoek. The following link is provided to a video that provides a good reinforcement of today's lesson:

<http://www.youtube.com/watch?v=NrgxvTnoo3A>





# The Digestive System

5

## ☑ Lesson Objectives

### Core Content Objectives

Students will:

- ✓ Identify important components of the digestive system and their functions
- ✓ Describe the process of nourishing the body from the time food is taken into the mouth until waste is removed from 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 series of steps in the digestive process presented in “The Digestive System” (RI.2.3)
- ✓ Interpret information from diagrams of the human body to understand the digestive process (RI.2.7)
- ✓ With assistance, categorize and organize facts and information within “The Digestive System” to determine the sequence of events in the digestive process (W.2.8)
- ✓ Determine the meaning of the new word *indigestion* formed when the prefix *in-* is added to *digestion*. (L.2.4b)
- ✓ Sequence five images illustrating the individual steps in the digestive process

## Core Vocabulary

**absorb, v.** To take in or soak up a substance, often gradually

*Example:* The ground will absorb most of the water when it rains.

*Variation(s):* absorbs, absorbed, absorbing

**esophagus, n.** A muscular tube that connects the throat to the stomach

*Example:* Gordon swallowed a piece of cheese and imagined it passing down his esophagus into his stomach.

*Variation(s):* esophagi, esophaguses

**filtering, v.** Passing through a device to remove unwanted material

*Example:* The water plant is filtering, or removing, unsafe elements from our drinking water all day and all night.

*Variation(s):* filter, filters, filtered

**saliva, n.** A watery liquid in the mouth that helps soften food, making it easier to swallow


*Example:* My mouth filled with saliva while the dentist worked on my teeth.

*Variation(s):* none

**villi, n.** The small finger-like threads inside the small intestine through which nutrients from food are absorbed into the body

*Example:* The villi inside the small intestine are essential for absorbing nutrients from food and providing the body with these nutrients.

*Variation(s):* villus

At a Glance	Exercise	Materials	Minutes
<b>Introducing the Read-Aloud</b>	<b>What Do We Already Know?</b>	Poster 3 (Cells, Tissues, Organ Systems)	10
	<b>Purpose for Listening</b>		
<b>Presenting the Read-Aloud</b>	<b>The Digestive System</b>	1-cup measuring cup or a clear container showing 6 cups of water	15
<b>Discussing the Read-Aloud</b>	<b>Comprehension Questions</b>		10
	<b>Word Work: Absorb</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<b>Extensions</b>	<b>Sequencing the Digestive Process</b>	Instructional Master 5B-1; Image cards 8–13; Internet connection; audio/visual equipment; [This activity may require advance preparation.]	20
	<b>Digestive System Matchup</b>	Instructional Master 5B-2	
<b>Take-Home Material</b>	<b>Family Letter</b>	Instructional Master 5B-3	*



# The Digestive System

5<sub>A</sub>

## ***Introducing the Read-Aloud***

**10** minutes

### **What Do We Already Know?**

Point to Poster 3 (Cells, Tissues, Organs, Systems) and review cell progression.

Tell students that today they will learn about the organs that play a role in the digestive system. Ask students if they know one of the main organs of the digestive system. (stomach) Tell students they will learn about several more organs in addition to the stomach. Explain that most of the digestive system's organs are located in the abdomen, sometimes called the belly. Have students touch their bellies. Tell them that their abdominal organs, the primary digestive organs, are found in this area.

### **Purpose for Listening**

Tell students that the process of breaking down, or digesting, food is a slow one. Muscular gates hold food back, as well as open to release digested food along the way. Ask students to listen carefully to learn where these gates, called sphincters, are.



## The Digestive System

### ◀ Show image 5A-1: The digestive system

Ah, boys and girls, when I look at you I can't tell whether you are hungry or whether you have just had a meal. But one thing I do know is that everybody in this room has a digestive system and that all of your digestive systems are working right now. There is a lot going on inside those bodies of yours!

You each eat several hundred pounds of food in one year. It takes roughly twenty hours for food to travel through your gut, or digestive tract, a long, complicated series of tunnels with openings at both ends. Where does the journey begin? Yes, the process<sup>1</sup> of digestion begins when you put a piece of food in your mouth.

1 or series of steps



### ◀ Show image 5A-2: Toothless baby

When you were born, most of your teeth were hiding under your gums. That's why babies start out with a liquid diet.<sup>2</sup> But once your first set of teeth came in, you were able to eat solid foods. You are at an age right now when you are probably losing some of those teeth and getting a new set. If so, maybe you are finding it hard to chew certain foods.

2 A liquid diet is nutrition you can drink. Babies start out drinking their food, which is mainly milk.

Your teeth help you break your food down into millions of tiny pieces. The longer you chew, the smaller the pieces become, and the easier it is to digest.

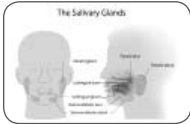


### ◀ Show image 5A-3: Teeth

Human teeth come in different shapes and sizes, designed to eat both plants and animals. Let's take a look at the different types of teeth you have in your mouth. The flat, wedge-shaped teeth at the front of your mouth are called incisors.<sup>3</sup> The incisors, both top and bottom, work together like a pair of scissors to bite, slice, and cut up your food. Next to the incisors are sharp, fang-like teeth called canines, or dogs' teeth. These teeth tear and rip food apart,

3 The incisors are thicker at one end than the other, similar to a piece of pie. [Point to the incisors on the image.]

- 4 With your tongue, touch the teeth in your mouth. Do you notice the different shapes your teeth have?



← **Show image 5A-4: Salivary glands**

Have you ever heard someone call food “mouth-watering”? What do you think that means? When you smell your favorite food, perhaps spaghetti and meatballs, your mouth probably starts to water as you think about how good it will taste. That watery substance, or spit, is called **saliva**. Saliva comes from small salivary glands<sup>5</sup> in your cheek and under your tongue. It helps keep your mouth damp and softens food as you chew, beginning to break food down for easy digestion. Saliva serves another important job as well, helping to wash away and kill bacteria.<sup>6</sup> Did you know that every day you produce as many as six cups of saliva in your mouth?<sup>7</sup> Can you feel it? Can you taste it?

What else do you have in your mouth besides your teeth and saliva?

← **Show image 5A-5: Upper digestive system**

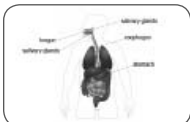
What’s the name of that fleshy muscle in your mouth that is covered in taste buds?<sup>8</sup> Your tongue, of course! Not only does your tongue help you taste your food, it also helps push the food around your mouth, rolling it into a mashed up, wet lump of food.

Your tongue pushes the lump of food to the back of your mouth and helps you swallow. Once food is swallowed, it passes into a food canal called the **esophagus**. This stretchy tube is only about ten inches long, leading from the back of your throat, through your neck and chest, to your stomach. Food passes through the esophagus quickly. Muscles squeeze together and push the food into the stomach in about ten seconds or less. It’s a lot like squeezing toothpaste from its tube.

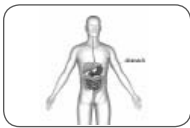
- 5 or organs

- 6 What is another word for unwanted bacteria? (*germs*)  
[Explain to students that germs are everywhere.]

- 7 [Show students a one-cup measure or a container with six cups of liquid.]

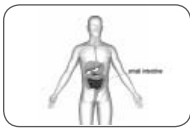


- 8 Taste buds are clusters of nerve endings.



← **Show image 5A-6: Middle digestive system**

Put your hand on the left side of your upper abdomen, just below your chest and above your waist. That's where your stomach lives, behind your lower ribs. This human mixing machine is shaped a bit like the letter 'J'. Your stomach acts like a balloon, expanding to hold the food it receives. The stomach's gastric juices help break down the food into a paste-like substance. These digestive juices also kill any germs that may have been swallowed. Round and round food churns for three to four hours as muscles squeeze inside the stomach walls. Once it is the substance of a thick soup, the food continues its journey into the intestines.



← **Show image 5A-7: Lower digestive system**

There are two types of intestines—the small intestine and the large intestine. The intestines are tubes located in the lower abdomen through which food and food waste travel. Even though there are two different kinds of intestines—the small and the large intestines, they are actually part of the same, long, single tube. A muscular gate, or sphincter, at the bottom of the stomach opens to allow food to flow from the stomach into the small intestine. The small intestine is about twenty-one feet long, or about as long as five seven-year-olds lying head to toe. Even though it's longer than the large intestine, it's called the small intestine because it's much thinner than the large intestine. This narrow tube, the small intestine, is coiled up like a snake below your belly button. Muscles squeeze together and push the mashed-up-soupy liquid along the curly, small intestine. The food is mixed once more with digestive juices from the liver, pancreas, and gallbladder, other organs that are part of your digestive system. The juices, called enzymes, break the food down and make it more and more watery along the way.

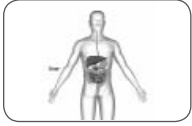


← **Show image 5A-8: Cross section of the small intestine**

The small intestine, with its millions of **villi**, or finger-like threads, is where some of the most important work of the digestive system takes place.<sup>9</sup> The villi reach out and **absorb**, or soak up, usable nutrients and water, passing them through the bloodstream

9 [Point to the villi on the image.]

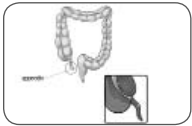
into all the cells of your body. Did you ever hear rumbling sounds coming from inside you? Chances are they are coming from your small intestine as muscles contract, or squeeze together, to break down food. They are the sounds of a healthy gut!



10 What does it mean when something is absorbed? (It is soaked up.)

◀ **Show image 5A-9: The role of the liver in the digestive process**

Most of the nutrients that are absorbed by the small intestine's many villi travel to the reddish-purplish liver, one of your body's important cleansing organs.<sup>10</sup> Your lower ribs on the right side of your body protect your liver. Its function is to clean the blood, **filtering**, or straining out any leftover waste. It turns this waste into bile, one of the juices used by the small intestine to help digest your food. The clean blood, with lots of nutrients, is carried to muscles to make them stronger, to bones to make them harder, and to every other part of your body to give you energy to help you grow. Since blood goes to every part of your body, the liver performs a very important function of making sure the blood circulating in your body is clean.

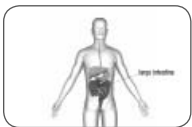


11 [Point to the image of the appendix.]

◀ **Show image 5A-10: The appendix<sup>11</sup>**

This finger-shaped organ is called the appendix. As far as anyone knows, it doesn't seem to be useful to the digestive system. From time to time, the appendix can become infected, or sick, and cause a disease called appendicitis. When people get appendicitis, they get a very sharp pain in the lower abdomen in the area surrounding the intestines. The pain comes from the appendix, located in the lower right side of your abdomen, near your hip bone. When it causes too much pain, doctors remove it. For many years, the appendix was considered a completely useless organ. Only recently have some doctors begun to think that the appendix may serve to fight infections.<sup>12</sup>

12 or kill germs



13 When something is solid, it is not liquid, or a gas.

◀ **Show image 5A-11: Lower digestive system**

The appendix is located right where the small intestine widens out into the large intestine. The large intestine is where the solid waste ends up.<sup>13</sup> Even though the large intestine is much, much shorter than the small intestine, it is called the large intestine because it is

much wider. Parts of food not digested in the small intestine are squeezed out into the large intestine where they remain for up to two days. Water is absorbed from the waste into the walls of the large intestine and passed into the bloodstream. The waste becomes thicker and thicker, piling up into a solid mass known as feces. Feces are stored in the rectum, the final section of the large intestine, until another muscular gate, or sphincter, opens and allows the feces to pass through the anus, the body's exit point for solid waste.



14 [Point to each of the relevant digestive organs as you read about it.]

◀ **Show image 5A-12: The digestive system**<sup>14</sup>

That is the end of your food's journey—from mouth to esophagus to stomach to small intestine to large intestine to anus. The digestive system's organs are working all the time, day and night, to process food into substances that your body can use, providing you with the nutrients and energy you need.

## ***Discussing the Read-Aloud***

**15** minutes

### **Comprehension Questions**

**10** 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 students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses.

1. *Literal* The human body has many muscular gates called sphincters. One is between the esophagus and the stomach. What other sphincters did you hear about today? (between the stomach and the small intestine; between the large intestine and the anus)
2. *Literal* What is the name of the long, stretchy tube that carries food from your throat to your stomach? (esophagus)
3. *Evaluative* You learned that both saliva and gastric juices work to kill germs. Why is that necessary? How do germs get into your body? (Germs are everywhere, and it is impossible not to breathe them through the air and ingest them with our food.)



4. *Inferential* If the intestines are one, long, coiled tube, why do you think we talk about them separately, using the terms *small intestine* and *large intestine*? (They perform different jobs. The small intestine is long and narrow, and its job is to break down food into nutrients, which are absorbed into the body through the villi. The large intestine is short and wider than the small intestine, and it houses waste for a time before passing the waste out through the anus.)
5. *Inferential* You learned that the liver filters waste from your blood. Why is it important to have clean blood? (Blood travels to all parts of your body, and it would not be good to have waste circulating through the body.)
6. *Literal* If you have appendicitis, the doctor may operate on you to remove one of your organs. What is the name of that organ? (appendix) Is it dangerous to remove the appendix? (No, doctors are not sure of its purpose, but some think it may help fight infections. You can live without the appendix.)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

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.

7. *Evaluative Think Pair Share:* After this read-aloud, you know what *digestion* means. If we put the prefix *in-* before a word, it changes the meaning of the word to *not* or *without*. If we put *in-* before the word *digestion*, we get the word *indigestion*. What do you think that means? What are some possible causes of indigestion? (Answers may vary, but let students know that indigestion causes pain or discomfort in the stomach. Causes may include swallowing food too quickly, before it has had time to break down in the mouth's saliva; eating too much so that it overloads the system; eating foods that irritate the stomach's lining.)
8. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

## Word Work: Absorb

5 minutes

1. In the read-aloud you heard, “The villi reach out and *absorb* usable nutrients and water, passing them through the bloodstream into all the cells of your body.”
2. Say the word *absorb* with me.
3. *Absorb* means to soak in a substance.
4. The paper towel will absorb the spilled water.
5. Think of an absorbent material, something that will absorb—or soak up—a substance easily. Use the word *absorb* or *absorbed* when you tell about a time you saw this happen. [Ask two or three students. If necessary, guide and/or rephrase students’ responses: “The grass absorbed \_\_\_\_\_”]
6. What’s the word we’ve been talking about?

Use a *Making Choices* activity for follow-up. Directions: I am going to name two words. You need to respond with a simple sentence, saying “\_\_\_\_\_ absorbs \_\_\_\_\_,” using the words in the correct order. For example, if I said, “pancakes” and “syrup,” you would respond, “Pancakes absorb syrup,” because syrup is soaked up by the pancakes, not the other way around. Remember to use the word *absorbs*: “\_\_\_\_\_ absorbs \_\_\_\_\_.”

1. trees/rainwater (Trees absorb rainwater.)
2. saliva/food (Food absorbs saliva.)
3. urine/diapers (Diapers absorb urine.)
4. towels/bath water (Towels absorb bath water.)
5. nutrients/villi (Villi absorb nutrients.)



**Complete Remainder of the Lesson Later in the Day**



# The Digestive System

**5<sub>B</sub>**

## **Extensions**

**20** minutes

### **Sequencing the Digestive Process (Instructional Master 5B-1)**

Hold Image Cards 8 (Mouth), 9 (Esophagus), 10 (Stomach), 11 (Small Intestine), 12 (Large Intestine), and 13 (Rectum and Anus) in your hand, fanned out like a deck of cards. Hand one card to each of six students. Students must then look at their cards and figure out the correct sequence for the digestive process. Ask them to stand in the proper order, facing the others so that they may give their input as well.

### **Digestive System Matchup (Instructional Master 5B-2)**

Have students complete Instructional Master 5B-2 to label the parts of the digestive system with the correct terms from the word bank.

## **Take-Home Material**

### **Family Letter**

Send home Instructional Master 5B-3.



# The Excretory System

6

## ☑ **Lesson Objectives**

---

### **Core Content Objectives**

---

Students will:

- ✓ Identify important components of the excretory system and their functions
- ✓ Describe how the digestive and excretory systems work together

### **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 connection between a series of steps in the excretory process in “The Excretory System” (RI.2.3)
- ✓ Interpret information from diagrams of the human body to understand the excretory process (RI.2.7)
- ✓ Compare and contrast the digestive system and the excretory system (RI.2.9)
- ✓ With assistance, categorize and organize facts and information from “The Excretory System” to make a diagram of the excretory system (W.2.8)
- ✓ Prior to listening to a read-aloud, identify orally what students know and have learned about the digestive system

## Core Vocabulary

**bladder, n.** A balloon-like sac in which urine collects before it is excreted from the body

*Example:* When I drink lots of water, my bladder seems to fill up very quickly.

*Variation(s):* bladders

**excrete, v.** To expel or get rid of

*Example:* Our bodies excrete moisture in the form of sweat and urine.

*Variation(s):* excretes, excreted, excreting

**regulate, v.** To control something

*Example:* My mom and dad regulate how much television I get to watch.

*Variation(s):* regulates, regulated, regulating

**sweat, n.** Moisture that comes out of the skin's pores due to exercise, fever, heat, or fear; perspiration


*Example:* Sweat ran down my face after the relay race.

*Variation(s):* none

**toxic, adj.** Poisonous

*Example:* The chemical factory dumped toxic waste into the river.

*Variation(s):* none

<i><b>At a Glance</b></i>	<b>Exercise</b>	<b>Materials</b>	<b>Minutes</b>
<i><b>Introducing the Read-Aloud</b></i>	<b>What Have We Already Learned?</b>		10
	<b>Purpose for Listening</b>		
<i><b>Presenting the Read-Aloud</b></i>	<b>The Excretory System</b>		15
<i><b>Discussing the Read-Aloud</b></i>	<b>Comprehension Questions</b>		10
	<b>Word Work: Toxic</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<i><b>Extensions</b></i>	<b>Model of the Excretory System</b>	Instructional Master 6B-1; two kidney beans for each student; yarn; scissors; glue or tape	20
	<b>Vocabulary Instructional Activity: Maintain</b>		



# The Excretory System

6<sub>A</sub>

## ***Introducing the Read-Aloud***

**10** minutes

### **What Have We Already Learned?**

Ask students to list some of the purposes of the digestive system and its organs. Answers may include: processing food, breaking it down into nutrients that the body can use, and getting rid of waste that the body can't use. Tell students that their bodies produce both solid and liquid waste. Remind students that the digestive system deals with solid waste, eliminating it in the form of feces. Tell them that today they are going to learn about the excretory system, the system that processes liquid waste.

### **Purpose for Listening**

Ask students to name an organ of the digestive system that cleans the blood. (liver)

Then tell them that today they are going to learn about two more organs, part of the excretory system, that filter waste from the blood. Ask them to listen carefully to learn the name of these two organs.



## The Excretory System

### ◀ Show image 6A-1: Nick Nutri and the lower digestive system

Humans are exposed to lots of toxins, or poisons, in the environment. Your body may take in toxins through the air or through the food that you eat. If these toxins hang around in your body too long, they may become **toxic**, or poisonous, to you. The amazing human body has ways of getting rid of these toxins before they become harmful.

Last time we met, you learned how your digestive system works to process food into usable nutrients, separating the nutrients from the sometimes-toxic waste materials.<sup>1</sup> At the end of the digestive process, some food is not completely broken down by the intestines.<sup>2</sup> This leftover solid waste, called feces, is pushed out of your anus at the end of the digestive tract.

Bowel movements contain your body's solid waste, but what happens to the body's liquid waste? Where does it go? Some waste leaves your body through your skin. Other waste is processed through a system like the digestive system. Just as the digestive system processes solid waste, there is a system that processes liquid waste. It is called the excretory system. To **excrete** means to expel, or get rid, of something that is not needed. Toxins, or poisons, are definitely not needed in your body.



### ◀ Show image 6A-2: Sweat

Let's begin by talking about the liquid waste that leaves the body through your skin. We call it **sweat**. What is another name for sweat? It is also called perspiration. You already know that your skin is the largest body organ. It covers your entire body surface. Sweat glands below the surface of the skin help rid the body of waste through perspiration. When you perspire, water, salt, and other waste flows out through these microscopic sweat glands.<sup>3</sup> They are excreted from all parts of your body. If you do not bathe

1 What are nutrients?

2 What are the intestines?

3 So, are we able to see these sweat glands? (No, they are microscopic, too small to see without the aid of a microscope.)

4 What are bacteria?



for a while, you can begin to smell this waste as it builds up on the surface of your skin.

The body's main liquid waste is urine, sometimes called pee. Urine is cleaner than spit. Unlike the saliva in your mouth, urine contains no bacteria.<sup>4</sup> It is about ninety-six percent water and four percent waste. This means that if urine were divided into one hundred parts, ninety-six parts would be water, and only four parts would be waste. Like feces, urine passes through several different organs as it makes its journey through your body. Today we will take a look at the organs that are a part of the excretory system.

← **Show image 6A-3: The kidneys**

The kidneys are the primary organs of excretion. Everybody, stand up for a minute so that I can make sure that you know where your kidneys are located. Let your arms hang by your sides. Your kidneys are in line with your elbows, at your back above your waist. Reach around and place your hands just above your waist on either side of your backbone. Your two kidneys hang near your spine, one on either side of your backbone, in the middle of your back. Your bottom ribs and layers of fat protect the kidneys. Do you have a pretty good idea of where they live? Okay, let's sit down and see how they work.

Arteries, or muscular tubes, carry blood from other parts of your body to your kidneys. These two, dark red, bean-shaped organs act like washing machines for the blood, cleaning it of waste and toxins. As blood flows to your body cells, it passes through the kidneys where millions of tiny microscopic filter tubes capture the waste products and excess, or extra, water.



← **Show image 6A-4: Strainer**

5 [Point to the strainer/sieve in the image.]

Think of a kitchen strainer or sieve.<sup>5</sup> Have you ever seen cooked pasta poured into a strainer? The liquid flows through and the strainer catches the pasta. Your kidneys act a little like that kitchen strainer. They filter, or separate, the liquid waste from the blood. Clean blood travels to your body's cells, while the liquid waste, called urine, is collected in each kidney.





← **Show image 6A-5: Diagram of kidneys, ureters, bladder, and urethra**

Urine drains out of both kidneys through two tubes called ureters. The ureters lead from the kidneys to your urinary **bladder**. The bladder is a muscular storage bag located in the lower part of your abdomen, which is below your waist. When it gets full, we can feel it. This stretchy, sac-like muscle stores urine. It is a little like a water balloon with three openings, the two ureters that connect to the kidneys, and a third opening at the other end of the bladder called the urethra. As urine passes into the bladder through the ureters, the walls stretch, and the rubbery balloon begins to fill.

Nerve endings in the muscular bladder walls send signals to the brain that the bladder is full and about to burst. That's when you know it is time to urinate. Urine passes out of your body through the urethra, the tube at the bottom of the bladder. Just like the anus, the urethra has a muscular gate, called the sphincter muscle, that opens and closes to let the urine pass. When the sphincter muscle is tightened, urine stays in the bladder. When it is relaxed, urine is released. This is a voluntary muscle, meaning that you are able to control its opening and closing, but you need to listen to your brain when it tells you that it is time to go to the bathroom. The excretory system works the same for both boys and girls. The only difference is in the length of the urethra. The urethra is longer in boys than it is in girls.



← **Show image 6A-6: Importance of drinking water**

In addition to preparing liquid waste for removal from the body, the kidneys also **regulate**, or control, the amount of salt and nutrients in the blood. They help to maintain a state of balance in the body by controlling the amount of water your body loses, balancing the amount of water excreted with the amount of water kept in the body.<sup>6</sup> If you have too much water in the body, you may feel bloated or swollen. If there is too little water in the body, you may become dehydrated, or dried out. Dehydration can cause serious damage to your body. That is why it is important to drink lots of water, never letting your body dry out.

6 What does *excreted* mean?

Let's name all of the different parts of the excretory system. The excretory system is made up of the kidneys, the bladder, the two tubes that connect them—the ureters—and the urethra, the final tube in the process. It may appear less complicated than the digestive system, but it is just as important for filtering the blood and helping your body get rid of toxic substances. You probably know that liquid waste is excreted from your body a bit more frequently than solid waste. That's because it does not stay in the bladder as long as solid waste stays in the rectum.



◀ **Show image 6A-7: Big and strong**

We've been talking a lot about getting rid of the body's waste, but along the way you have learned that the body turns a lot of the food that you eat into nourishment and provides your body with the energy that it needs to grow and repair itself. What are the good parts that are carried through your blood and stored in your body called? <sup>7</sup> Next time, we'll find out just exactly what nutrients are and what you can do to make sure that you are getting enough of them.

See you next time. Until then, make sure that you listen to your body and respond when it sends you messages. That's really important to maintaining good health.

7 (nutrients)

### Comprehension Questions

10 minutes

1. *Literal* What are the names of the two red, bean-shaped organs that clean the blood of undesirable substances? (kidneys)
2. *Literal* Once the blood is filtered, two tubes called ureters carry the leftover liquid waste from the kidneys to a balloon-like storage bag. What is this stretchy bag called? (bladder or urinary bladder)
3. *Inferential* What does the word *urinate* mean? (to pass urine from the body)
4. *Literal* Urine is the body's main liquid waste. What is another form of the body's liquid waste? (sweat or perspiration)
5. *Literal* Solid waste passes out of the body through an opening called the anus. What is the name of the opening through which urine leaves the body? (urethra)
6. *Evaluative* How are the digestive and excretory systems similar? (The digestive system gets rid of waste, and the excretory system also gets rid of waste.) How are the digestive and excretory systems different? (The digestive system deals with solid waste, and the excretory system gets rid of liquid waste. The digestive system also processes food and liquids into nutrients for the body. The excretory system just processes waste.)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

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.

7. *Evaluative Think Pair Share:* You are watching a marathon race. One of the runners has not had anything to drink during the race and suddenly collapses. What is a logical explanation for his collapse? (Answers may vary, but lead students to the conclusion that the runner may be dehydrated. Discuss the importance of replenishing the body with liquids, especially during periods of exercise.)

8. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

### Word Work: Toxic

5 minutes

1. In the read-aloud you heard, "If these toxins hang around in your body too long, they may become *toxic*, or poisonous, to you. "
2. Say the word *toxic* with me.
3. A toxic substance is poisonous; it will kill or injure living things.
4. Chocolate can be very toxic to some pets.
5. If a container has a picture of a skull and crossbones on it, you should not use it without the assistance of an adult. Think of a time when you saw that symbol and tell us what product had it on the label. If you haven't seen something with a picture of a skull and crossbones on it, think of something else you know of that is poisonous. Use the word *toxic* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "The toxic spray was used to . . . "]
6. What's the word we've been talking about?

Use a *Making Choices* activity for follow-up. Directions: I am going to name several common household products that may or may not be toxic, or poisonous to humans. If the product is toxic, say, "That's toxic." If it is not harmful to humans, say, "That's not toxic." Remember to answer in complete sentences.

1. insect spray (That's toxic.)
2. milk (That's not toxic.)
3. gasoline (That's toxic.)
4. dog food (That's not toxic.)
5. drain cleaner (That's toxic.)
6. cookies (That's not toxic.)



**Complete Remainder of the Lesson Later in the Day**



# The Excretory System

# 6<sub>B</sub>

## Extensions

20 minutes



### Model of the Excretory System (Instructional Master 6B-1)

#### ◀ Show image 6A-5: Diagram of kidneys, ureters, bladder and urethra

Discuss the organs of the excretory system, and review how the system works to excrete urine from the body. Give each student a copy of Instructional Master 6B-1, two kidney beans, a length of yarn, scissors, and glue or tape. Ask students to use the printed diagram as a model for adding the parts. When they have finished gluing or taping, have them label the parts, using the words provided at the bottom of the page.

#### ↔ Vocabulary Instructional Activity

##### **Word Work: Maintain**

1. In the read-aloud today, you heard that the kidneys “help to maintain a state of balance in the body by controlling the amount of water your body loses, balancing the amount of water excreted with the amount of water kept in the body.”
2. Say the word *maintain* with me.
3. The word *maintain* means to keep something the same way. So the kidneys maintain, or keep a state of balance in the body, by controlling the water your body uses.
4. It’s important to maintain your car in good repair so it won’t break down.
5. Students who maintain good grades usually do so by always completing their homework and studying for tests. Can you think of anything else that you or someone or something else might maintain? [Ask two or three students. If necessary guide and/or rephrase students’ answers, “\_\_\_\_\_ maintain \_\_\_\_\_.”]

6. What's the word we've been talking about? What part of speech is *maintain*?

Use a *Discussion* activity for follow-up. Directions: Tell your partner about something that you maintain or something you have seen somebody else maintain. Describe in detail what you do or have observed being done to maintain this thing.

### **Domain- Related Trade Book**

---

Refer to the recommended trade books in the domain introduction at the front of this teacher's guide, and choose one that provides information about the digestive and excretory systems to read aloud to the class. As you read, pause and ask occasional questions, rapidly clarifying critical vocabulary within the context of the read-aloud, etc. After you finish reading the trade book, lead students in a discussion as to how the information in the book relates to the read-aloud they heard today.



# Nutrients

7

## ☑ Lesson Objectives

---

### Core Content Objectives

---

Students will:

- ✓ Explain the importance of vitamins and minerals to 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 connection between nutrients and good health as described in “Nutrients” (RI.2.3)
- ✓ Interpret information from a food groups chart to explain the nutrients that can be obtained from eating from certain food groups (RI.2.7)
- ✓ Make personal connections in understanding the specific nutrients consumed at breakfast (W.2.8)
- ✓ With assistance, categorize and organize facts and information about nutrients to answer questions (W.2.8)
- ✓ Add drawings about various foods to clarify ideas, thoughts, and feelings about proper nutrition (SL.2.5)

## Core Vocabulary

**carbohydrates, n.** Substances that supply the human body with energy  
*Example:* Sugar and starch are carbohydrates found in many plant foods.


*Variation(s):* carbohydrate

**essential, adj.** Absolutely necessary; extremely important  
*Example:* Water is essential to the life of all plants and animals on Earth.  
*Variation(s):* none

**fats, n.** Substances that are essential to a healthy body in small doses  
*Example:* Butter and oils are fats that may be well hidden in some of our favorite foods.  
*Variation(s):* fat

**minerals, n.** Inorganic (nonliving) substances, small quantities of which are part of a healthy diet  
*Example:* If you eat different kinds of foods, your body will probably get all the minerals it needs.  
*Variation(s):* mineral

**proteins, n.** Substances, found in all body cells, that are essential for growth  
*Example:* Eggs and milk, both high in proteins, are a good way to start the day.  
*Variation(s):* protein

At a Glance	Exercise	Materials	Minutes
<b>Introducing the Read-Aloud</b>	What Have We Already Learned?		10
	Purpose for Listening		
<b>Presenting the Read-Aloud</b>	Nutrients		15
<b>Discussing the Read-Aloud</b>	Comprehension Questions		10
	Word Work: Essential		5
 Complete Remainder of the Lesson Later in the Day			
<b>Extensions</b>	What Did You Eat for Breakfast?	Poster 4 (Carbohydrates); Poster 5 (Proteins); Poster 6 (Fats); Poster 7 (Water); 4" by 4" sheets of paper or sticky notes, several per student; drawing tools	20
	Syntactic Awareness Activity: Adverbs		





# Nutrients

7<sub>A</sub>

## ***Introducing the Read-Aloud***

**10** minutes

### **What Have We Already Learned?**

Share the title of the read-aloud with students, and ask them what they have already learned about nutrients. What are nutrients? (substances that provide nourishment; necessary for all life) How does the body get nutrients? (contained in food and drink) How do nutrients travel through the body? (through the blood)

Students may name specific foods as nutrients; tell them that the foods themselves are not nutrients, but that different nutrients are contained in different foods.

### **Purpose for Listening**

Tell students that most of the read-aloud they hear today will be about the four main nutrients their bodies need to grow. Tell them to listen carefully to learn about two other important nutrients, and to learn about all six nutrients essential to healthy bodies.

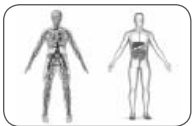


## Nutrients

### ◀ Show image 7A-1: What do you eat?

Why do you eat? Is it because certain foods taste really good to you? That's surely one reason why I eat. I cannot imagine my world without the taste of a fresh bowl of vegetable soup or a peppermint stick ice cream cone on a summer's day. You also eat because you get hungry, right? Your tummy grumbles and complains if it hasn't been fed for a long time. But what is the main reason you eat?

Ah, at last—Nick Nutri's chance to talk about my favorite topic: nutrients. You eat because you need the nutrients that food provides to stay healthy.



### ◀ Show image 7A-2: Circulatory and digestive systems

We have talked a lot about nutrients in the previous lessons. You know that your blood carries nutrients to all parts of the human body. Your digestive and excretory systems filter waste from the body and send nutrients back into the blood.<sup>1</sup> Your cells need nutrients to stay alive. Your tissues need nutrients to function properly. Your organs stop working without the right nutrients, and if your organs stop working, your body's systems might stop working, too!<sup>2</sup>

You know that nutrients are good for you. But what exactly are nutrients? Nutrients are substances that provide nourishment necessary for the growth and health of an organism. Providing the body with the nutrients it needs is an **essential**<sup>3</sup> part of staying healthy.

So, how do you get nutrients? Yes, from the food you eat. Nutritionists, like me, think of the body as a chemical factory.<sup>4</sup> Everything you eat is made up of thousands of different chemical substances. The ones that every healthy body needs to stay alive are called nutrients.

- 1 What are some of your other body systems aside from digestive and excretory? (circulatory, muscular, skeletal, and nervous systems)
- 2 What are cells? (the smallest building block of life on Earth) What is tissue? (groups of cells that perform the same jobs in living things) What are organs? (groups of different types of tissue that do a particular job for the body) What is a body system? (a collection of organs that work together for the same purpose)
- 3 or necessary
- 4 What is a factory? (a place or building where things are made)



← **Show image 7A-3: Basic nutrients**

Everyone needs four basic nutrients—water, **carbohydrates**, **proteins**, and **fats**. These nutrients come from different food sources. It is up to you to choose the right foods to supply your bodies with the proper balance of water, carbohydrates, proteins, and fats. Today I am going to teach you how to make the best food choices for maintaining a healthy body.

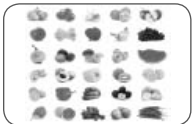


← **Show image 7A-4: A glass of water**

Let's start with the nutrient that is familiar to everybody: water. Water is perhaps the most important nutrient of all. It is necessary for all body functions.<sup>5</sup> You cannot live for more than about a week without water. Did you know that two-thirds of your body is made up of water? Water is part of your blood. It travels in and out of your cells and helps to dissolve other nutrients, carrying them to all your tissues. Water is a necessary part of the excretory system, making up most of your urine. Water helps break down your food so that solid waste can pass from your body. Water even helps maintain the right body temperature.

When given a choice of what to drink, water is always the healthiest choice you can make. It is up to you to constantly refill your body's supply of water. You need between three and six cups each day, but not all of your water needs to come from a cup.

5 What's another word for *functions*?  
(jobs or purpose)



← **Show image 7A-5: Sources of water in food**

Did you know that many foods contain lots of water, too? Grapefruit, watermelon, tomatoes, cucumber, and lettuce are all good choices. One way to tell whether you are getting enough water is to check the color of your urine. It should be practically colorless.

All nutrients supply your body with energy, but the body's main source of energy comes from carbohydrates.



← **Show image 7A-6: Carbohydrates**

Carbohydrates are found almost entirely in plant foods—fruits, vegetables, whole grains, peas, and beans. Potatoes, rice, and pasta are good choices for carbohydrates. Milk and milk products, like ice cream and yogurt, provide the body with carbohydrates and protein. Cheese has only a few carbohydrates.



← **Show image 7A-7: Protein**

Protein is a body-builder, contained in all body cells. It is necessary for your body's growth and development, building muscle and helping to repair cells. It's easy to see how cells outside the body—like hair, skin, and nails—renew themselves, isn't it? Each time we cut them, they grow right back! The body makes its own protein, but it needs help from foods. Good sources of protein include meat, fish, chicken, eggs, milk, and beans.



← **Show image 7A-8: Fats**

The fourth nutrient that your body needs is fat.<sup>6</sup> Butter, margarine, and oils are good sources of fat. Today, many people are overweight, so it may seem strange to you that I am telling you to include fat in your diet, but your body does need a certain amount of fat. Does anyone know why?

Well, for one thing, fat is necessary for the development of your brain, especially in the first few years of your life. When you looked at skin cells under a microscope, do you remember seeing the layer of fat cells? A thin layer of fat underneath your skin acts like a blanket, providing you with insulation<sup>7</sup> and warmth. Fat stores energy in your body and helps keep your skin healthy, too.

So, you see, fat is an important nutrient, but you only need very small amounts of it. Your body can make most of its building blocks from carbohydrates and proteins. After about age two, you need to be careful not to eat too much fat because that might cause you to gain too much weight.

6 What are the other three nutrients we just discussed? (water, carbohydrates, and protein)

7 or protection

- 8 What does *essential* mean?  
(necessary or important)
- 9 made from living organisms
- 10 which are nonliving substances  
found in nature

So far, you've learned that the body needs four basic nutrients to grow and stay healthy. What are they? Great—water, carbohydrates, proteins, and fats. These are not the only nutrients your body needs. There are other important nutrients that are also essential to life.<sup>8</sup> They are called vitamins<sup>9</sup> and **minerals**.<sup>10</sup> Your body needs less of them, but if you don't get enough vitamins and minerals, you can become sick.

Long ago, sailors lived on a diet of only biscuits and salty meat while they were out at sea. They began to suffer from bleeding gums, and their bones became weak. Once they added lemons and limes to their diet, the sailors became much better. Why do you think that is?



← **Show image 7A-9: Vitamins and food**

Citrus fruits, like lemons, limes, oranges, and grapefruits, gave the sailors the Vitamin C that they needed to keep their blood vessels, gums, and teeth healthy. Vitamin C also helps build tissue to fight germs. That's why your mom or dad might give you extra orange juice if you feel like you're catching a cold. If you aren't a fan of citrus fruits, broccoli and tomatoes are also good choices to make sure you are getting enough Vitamin C.



← **Show image 7A-10: Vitamin alphabet**

Letters of the alphabet, like the letter 'C,' are used for many vitamins. There's Vitamin A, Vitamin B, Vitamins C, D, and E—and so many more! Vitamin A is important for healthy skin and helps you see more clearly at night. Dairy products, carrots, and dark, leafy greens contain lots of Vitamin A. There are many different B vitamins—Vitamin B1, Vitamin B2, Vitamin B3, and so on. The B vitamins, found mostly in meat, help the body perform lots of different functions. For example, B12 helps make red blood cells. Vitamin D, found in fish and egg yolks, helps build strong bones.

Most of the vitamins you need come from vegetables, fruits, and grains. All vitamins are essential in small doses, or amounts. If you have a healthy diet, you are probably getting all the vitamins you need.



← **Show image 7A-11: Fluoride**

Fluoride is a mineral that is often added to public drinking water. It is contained in some toothpaste and mouthwash as well. This is because fluoride helps prevent tooth decay. Your body needs small amounts of different minerals, such as fluoride, to help perform specific body functions.

Besides fluoride, other minerals include calcium, sodium, and iron.



← **Show image 7A-12: Sources of minerals**

You can help your teeth and bones stay strong by eating foods rich in calcium. Milk, broccoli, and almonds are good choices. Sodium—found in table salt, bacon, and lots of soup broths—helps regulate the body's fluids. Then again, too much salt is not good for you. It causes the body to hold onto too much fluid, which can cause high blood pressure. If you feel weak, look pale, and get tired easily, you may need more iron. Eat more red meat, whole grains, and beans. Iron helps the blood carry oxygen throughout the body and helps the body fight infections.

Each one of these minerals provides important nutrients for your body. As with vitamins, you can get most of the minerals you need by eating a healthy diet. That's what we will talk about next time we meet—the best foods for you to eat!

### Comprehension Questions

10 minutes

1. *Literal* What are the four basic nutrients the body needs to grow? (water, carbohydrates, proteins, fats) What are two other nutrients needed by the body in lesser amounts? (vitamins and minerals)
2. *Inferential* In the read-aloud you learned that your body is two-thirds water. How much of your body then is not made up of water? (one-third, since two-thirds of the body is made up of water)
3. *Literal* Which one of the four basic nutrients supplies most of the body's energy? (carbohydrates)
4. *Literal* At what stage of life do humans need the most fats in their diets? (before the age of two)
5. *Evaluation* If your hair and nails stop growing, which essential nutrient are you most likely missing? Why? (Protein; because it helps repair cells and is responsible for new growth.)
6. *Literal* Which vitamin, supplied by citrus fruits like oranges, lemons, and limes, helps build tissue to fight germs? (Vitamin C)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

I am going to ask you 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:* Vitamin D is sometimes called “the sunshine vitamin” because sun is a better source of Vitamin D than most foods. If you apply sunblock when you go outdoors, your skin will not make Vitamin D, but the sunblock will protect you from some of the sun's harmful rays. How else do people get enough Vitamin D to build strong bones? (Answers may vary, but may include the fact that many people take vitamin supplements if they are not getting enough of one vitamin or another. Tell students that they should always discuss such matters with their family members or a doctor.)

10. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

### Word Work: Essential

5 minutes

1. In the read-aloud you heard, "Providing the body with the nutrients it needs is an *essential* part of staying healthy."
2. Say the word *essential* with me.
3. *Essential* means absolutely necessary.
4. When traveling by public transport, it is essential to arrive before the departure time on the transport schedule; otherwise, you will miss your ride.
5. Think of some things that are essential to our classroom. What is absolutely necessary to making our day run smoothly? Use the word *essential* when you tell us about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "It is essential for everyone to . . ."]
6. What's the word we've been talking about?

Use a *Making Choices* activity for follow-up. Directions: I am going to name some common daily activities. If what I say is essential, or necessary, to staying healthy, say, "That's essential." If it is not essential to staying healthy, say, "That's not essential." Remember to answer in complete sentences.

1. singing songs (That's not essential.)
2. eating chocolate (That's not essential.)
3. sleeping well (That's essential.)
4. drinking water (That's essential.)
5. reading books (That's not essential.)



**Complete Remainder of the Lesson Later in the Day**





# Nutrients

7<sub>B</sub>

## Extensions

20 minutes

### What Did You Eat for Breakfast?

Focus students' attention on the four nutrients posters: Poster 4 (Carbohydrates), Poster 5 (Proteins), Poster 6 (Fats), and Poster 7 (Water). Review the four basic nutrients that everybody needs (water, carbohydrates, proteins, and fats). Tell students that they are going to draw the foods that they ate for breakfast and attach the drawings to the most appropriate chart. Tell them that some foods may contain more than one nutrient and that they must make a decision about which one is more abundant, or is the main one. Tell them to draw only one item on each square piece of paper or sticky note. For example, if they had orange juice, cereal, and milk, they would use three separate sheets of paper or sticky notes to draw their breakfasts.

Once everyone has completed the task, pair students to talk about which nutrients they consumed at breakfast (including vitamins and minerals), whether they think they made good breakfast choices, and what they need to include in their other meals today in order to get the daily nutrients they need.

### Syntactic Awareness Activity: Adverbs

**The purpose of these syntactic activities is to help students understand the direct connection between grammatical structures and the meaning of text. These syntactic activities should be used in conjunction with the complex text presented in the read-alouds.**

**Note:** There may be variations in the sentences created by your class. Allow for these variations, and restate students' sentences so that they are grammatical.

1. We know that many verbs are action words. Today we will practice using adverbs. Adverbs describe action words or verbs.

2. In the read-aloud you heard that you see more *clearly* at night when you take vitamin A.
3. What is the action word or verb? (see) What word describes the action? (*clearly*) See is an action word. *Clearly* is the adverb that is used to describe how you see at night when you take vitamin A. [Remind students that words that describe action words or how we do something are called adverbs.]
4. [Have students repeat what you say and how you say it. This first example uses the verb *speak* and the adverbs *softly*, *loudly*, *quickly*, *slowly*.] We can use adverbs to describe how we speak. Listen to how I say something, and repeat what I say and how I say it. What words, or adverbs, could we use to describe how we are speaking? (*softly*, *loudly*, etc.)
  - a. I am speaking *softly*. [Use a lowered voice when speaking this sentence.]
  - b. I am speaking *quickly*. [Use a fast pace when speaking this sentence.]
  - c. I am speaking *loudly*. [Use a loud voice when speaking this sentence.]
  - d. I am speaking *slowly*. [Use a slow pace when speaking this sentence.]
5. Now you try! First, one partner claps in a certain way so that the other partner can repeat it. Then, work together to describe the way you clap. (Some suggestions: *loudly*, *softly*, *quickly*, *slowly*, etc.) What are these describing words called? (adverbs)



# A Well-Balanced Diet

8

## ☑ **Lesson Objectives**

---

### **Core Content Objectives**

---

Students will:

- ✓ Explain the importance of eating a balanced diet
- ✓ Classify foods as healthy or unhealthy
- ✓ Plan a daily balanced diet

### **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:

- ✓ Interpret information using a chart made of a paper plate to which photos of various types of food have been affixed in order to describe the nutrients in certain foods (RI.2.7)
- ✓ With assistance, categorize and organize facts and information about nutrition in order to make good food choices (W.2.8)
- ✓ Determine the meaning of the multiple meaning word *skip* in “A Well-Balanced Diet” (L.2.5a)
- ✓ Prior to listening to a read-aloud, orally identify what students know and have learned about nutrients

## Core Vocabulary

**fiber, n.** Fiber is the part of plant foods that your body can't digest or absorb

*Example:* A diet rich in fiber makes you feel fuller and is helpful for proper digestion.

*Variations:* fibers

**moderation, n.** The act of keeping things within a middle range, neither too great nor too little

*Example:* Keeping all things in moderation is a good rule to live by.

*Variations:* none

**scan, v.** To look around an area quickly

*Example:* Henry and Lucinda scan the parking lot looking for the lost car keys.

*Variations:* scans, scanned, scanning

**variety, n.** A range of different things


*Example:* My scout troop sells a wide variety of cookies every year.

*Variation(s):* varieties

**well-balanced diet, n.** A variety of foods, eaten in proper proportions

*Example:* A well-balanced diet includes lots more vegetables than ice cream.

*Variation(s):* none

<i><b>At a Glance</b></i>	<b>Exercise</b>	<b>Materials</b>	<b>Minutes</b>
<i><b>Introducing the Read-Aloud</b></i>	<b>What Have We Already Learned?</b>		10
	<b>Purpose for Listening</b>		
<i><b>Presenting the Read-Aloud</b></i>	<b>A Well-Balanced Diet</b>	some unusual fruits and vegetables (optional)	15
<i><b>Discussing the Read-Aloud</b></i>	<b>Comprehension Questions</b>		10
	<b>Word Work: Variety</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<i><b>Extensions</b></i>	<b>Planning a Daily Balanced Diet</b>	paper plates, three per student group; magazines with numerous pictures of food; scissors; glue or tape	20
	<b>Multiple Meaning Word: Skip</b>	Poster 4M (Skip)	



# A Well-Balanced Diet

8<sub>A</sub>

## ***Introducing the Read-Aloud***

**10** minutes

### **What Have We Already Learned?**

What are the four basic nutrients needed by the human body? (water, carbohydrates, protein, and fats) What other two nutrients does the body need in smaller amounts? (vitamins and minerals) Tell them that today they will learn more about each one of these nutrients so that they will be better able to plan healthy meals for themselves.

### **Purpose for Listening**

Tell students to close their eyes and imagine their favorite grocery stores. Tell them to think about their favorite aisles and what foods they particularly like to put in their grocery carts. Ask them to listen carefully to find out in which area of the grocery store they should spend most of their time and why.



## A Well-Balanced Diet

### ◀ Show image 8A-1: Favorite foods

If you could eat whatever you wanted, what would you choose? Would it be a breakfast meal of cereal, orange juice, and toast? Pancakes loaded with butter and syrup with a side of bacon or sausage? Perhaps you'd choose a juicy hamburger with French fries and slaw. What about pizza or shrimp lo mein? Maybe you'd favor enchiladas or souvlaki? Or would you choose a fish taco and tomato soup? You each have different favorites, I'm sure. Hopefully, as you learn more about nutrition and the nutrients your body needs, you will begin to think more about what you eat, making wise choices so that you can maintain a healthy body throughout your life.<sup>1</sup>

1 What is nutrition? (nourishing substances, necessary for growth and the maintenance of life)

2 What does *essential* mean? (necessary)

3 or a range of different things

Providing the body with the nutrients it needs is an essential part of staying healthy.<sup>2</sup> Have you ever heard someone say "Variety is the spice of life?" That usually means that you should spend your time doing lots of different things, but it holds true for your diet as well. You've learned that the body needs **variety**<sup>3</sup>—a variety of nutrients that come from a variety of foods. Your body makes most of its building blocks from proteins and carbohydrates, but it needs fats and lots of water, too. And don't forget about vitamins and minerals! They're nutrients, too.

The best way to make sure that you are getting all the nutrients you need is to eat a **well-balanced diet**. What do you suppose that means?



### ◀ Show image 8A-2: Pizza and fried chicken

Well, for one thing, it means you don't have to give up your favorite foods, even if they may not be the healthiest ones on the planet. Just don't eat pizza or fried chicken at every meal. My dad used to say, "Eat in **moderation**." He meant that I shouldn't eat too much or too little of any one thing. I love chocolate chip

cookies so much that I could easily eat a whole batch, but I had to learn to eat slowly and be satisfied with one or two.

Balancing your diet with lots of different foods is important. Think about all of the different nutrients your body needs. These nutrients come from a variety of foods. A well-balanced diet includes grains, fruits, vegetables, dairy, meats and fish, and fats.



◀ **Show image 8A-3: Grains**

Do you remember which one of the four basic nutrients is contained in grains—carbohydrates or fats? Right—carbohydrates. Grains also contain small amounts of protein and fats, but carbohydrates make up the largest amount of nutrients in grains. There is a lot of variety when it comes to choosing a grain for dinner. Grains include rice, pasta, bread, and cereal. Think of all the many types of pasta alone—spaghetti, macaroni, penne, and rigatoni—the list goes on and on. If you have a choice between brown rice and white rice, brown contains more nutrients. The same is true of breads. Whole wheat bread is better for you than white bread. When choosing a cereal, find one that isn't loaded with extra sugar.



◀ **Show image 8A-4: Starch and sugar**

You learned that the body needs energy and that most of its energy comes from carbohydrates. That's because the body breaks down large carbohydrates, like the starch in potatoes or spaghetti, into smaller carbohydrates like sugar, which contains a lot of energy that the body can use. Table sugar comes from the roots and stems of plants, like sugar beets and sugarcane, and will give you instant energy. But the kind of sugars found in potatoes and pasta are much better for you than digging into the sugar bowl or reaching for a candy bar. Both give you energy, but candy gives you a quick burst of energy that is soon gone, whereas the energy in potatoes and pasta lasts much longer because it is released into your body much more slowly. If you're hungry, a baked potato will satisfy your hunger much longer than a handful of chocolate candy.



#### ← Show image 8A-5: Other carbohydrates

What other foods are rich in carbohydrates? Yes, fruits and vegetables—apples, bananas, carrots, and broccoli. They all provide your body with energy. Just like grains, the natural breakdown of sugar from a fresh piece of fruit is far better for you than a hot-fudge sundae. Choose a naturally sweet-tasting beet or an ear of sweet corn over eating a teaspoonful of sugar from the sugar bowl. The next time you go to the grocery store, **scan**, or look quickly around, the produce section for some fruits and vegetables that you may not have tried. Have you ever tried kohlrabi or kiwi fruit?<sup>4</sup> Remember, variety is the spice of life.

4 [You may want to show students some of the more unusual fruits and vegetables with which they may not be familiar.]



#### ← Show image 8A-6: Sources of fiber

In the lesson on the digestive system, you learned that the body was not able to process some foods and so they leave the body as waste. **Fiber**, a very important carbohydrate, is one kind of waste. Fiber is the part of plant foods that your body can't digest or absorb. Since your body cannot digest it, fiber is not a nutrient, but a good diet should include lots of fiber to help keep things moving along the digestive tract. Oranges, pears, berries, peas, and nuts will give you the fiber that you need.



#### ← Show image 8A-7: Sources of protein

Meat, fish, eggs, and dairy are all good sources of protein and they are all animal products. Some people are vegetarians, meaning that they do not eat meat. And some people are vegans meaning they do not eat or use any animal products, such as eggs, cheese, milk, or meat. We know how important protein is for the growth and repair of our bodies, so are there other ways for vegetarians or vegans to get the protein they need? Yes, indeed! Certain combinations of grains, corn, and beans contain all the protein that your body needs. Good combinations include beans and brown rice, hummus and pita bread, or lentils with a green salad. Nuts are rich in protein, too, as are all soybean products, like tofu and soymilk. Yogurt is another good source of protein; just limit the sweetened, flavored varieties because of the added sugars.





← **Show image 8A-8: Fats**

Let's not forget the fats in your well-balanced diet. Meat and dairy products contain lots of fat, and butter and oils are nearly a hundred percent fat. They are the back-up energy source when your body needs a boost, but most of the fat you need is already stored in your body. Each day, you only need the amount of fat contained in about one tablespoon of vegetable oil to keep your body healthy. Many of us eat much more than that. Fat is a little like sugar. It contains important nutrients, but they are very few compared to other foods. Foods rich in vitamins, like fresh fruits and vegetables, are a much better choice than greasy, fried foods made with lots of fat. Too much fat can make you overweight and cause damage to your heart and blood.



← **Show image 8A-9: Breakfast, the most important meal of the day**

Have you ever heard that breakfast is the most important meal of the day? Do you know why? The word *breakfast* means to break the fast. You fast, or don't eat, every night when you sleep. That's a long time to go without food. Both your body and your brain need to be recharged in the morning, so you need to break the fast with breakfast. Without food, you may feel tired and grumpy because you don't have all the energy you need to get going in the morning. You may stumble over math problems, thinking five plus seven equals twenty, or skip over a line in your reader so that your sentences are all mumbo-jumbo.<sup>5</sup> Think about starting every day with some healthy proteins and carbohydrates so that both your body and your brain are at their best.

5 The word *skip* as used in this sentence means to miss something. *Skip* can also mean to move forward in a light or playful way by taking short, quick steps and jumps.



← **Show image 8A-10: The produce aisle**

Generally speaking, the fresher the food, the better it is for you. That is why it makes sense to spend more time in the produce aisle of the grocery store instead of stocking up on packaged foods like potato chips, canned spaghetti, and frozen chicken nuggets. These processed foods often have lots of added salts and sugars and are stripped of the vitamins and minerals that your body needs.

If you do choose packaged foods, make a habit of checking the labels on the outside wrappers before adding them to your cart. Food labels tell how big a serving is, which essential nutrients are provided, and the quantities of each nutrient per serving. It is important to limit the amount of food eaten that is high in sodium, sugar, or fat.



← **Show image 8A-11: Sugar**

Check out the label from a can of soda. Did you know that there are ten teaspoons of sugar in one soda? Sodas have no nutritional value, cause tooth decay, and put on unhealthy pounds. What would be a better choice of beverage? Water is always best, but milk and fruit juices contain vitamins and minerals, so they are good choices, too, in small amounts.



← **Show image 8A-12: Macaroni and cheese or a salad?**

The next time you go to the grocery store, look in your grocery cart and see if the foods you've chosen are part of a well-balanced diet. Remember to eat a variety of foods with more fruits and vegetables than anything else. Next time you eat a big plate of macaroni and cheese, think about adding twice as many dark leafy greens to your plate!

## ***Discussing the Read-Aloud***

**15** minutes

### **Comprehension Questions**

**10** minutes

1. *Literal* In which area of the grocery store will you find the healthiest foods? (produce section) Why are fresh foods better for you than processed foods? (Processed foods often have added salts and sugars, and are stripped of vitamins and minerals.)
2. *Inferential* Pretend that you just ate a meal that consisted of fried fish, a baked potato and butter, green beans, and a glass of milk. Which of the four basic nutrients did you consume and from which foods? (carbohydrates—potato and green beans; protein—fish and milk; fats—butter or oil used to fry the fish; water—milk, potatoes, and green beans)

3. *Literal* You learned that fiber—the part of fruits, vegetables, and grains that cannot be digested and becomes body waste—is an important carbohydrate. Why is fiber so important if the body cannot use it for nutrients? (Fiber helps food move more quickly through the digestive tract.)
4. *Literal* Vegetarians do not eat meat, and vegans do not eat any animal products, including meat, fish, eggs, and dairy products. These foods are all rich sources of protein, so how do vegetarians or vegans get the protein they need? (They learn how to combine grains and beans, nuts, and soy products to get all the protein they need.)
5. *Inferential* Athletes need lots of energy before sporting events. Which one of the four basic nutrients will provide them with most of the energy they need? (carbohydrates)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

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.

6. *Evaluative Think, Pair, Share:* Pretend that for an afterschool snack you are offered soda, a bag of chips, a cup of almonds, a strawberry-flavored carton of yogurt, and an apple. Which of these items is the healthiest for you and why? (the apple and almonds; The apple provides energy and fiber with natural sugars. The almonds are rich in protein and fiber. The soda and yogurt have added sugars, and the chips have added salt and fats.)
7. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

## Word Work: Variety

5 minutes

1. In the read-aloud you heard, “You’ve learned that the body needs *variety*—a variety of nutrients that come from a variety of foods.”
2. Say the word *variety* with me.
3. *Variety* means different types of the same general class of things.
4. The park has a large variety of trees.
5. Think of things that come in a variety of different kinds. For example, bread comes in a variety of different kinds, such as bagel, whole grain, raisin bread, etc. Tell us what your favorite variety is and why. Use the word *variety* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase students’ responses: “My favorite variety of bread is . . . ”]
6. What’s the word we’ve been talking about?

Use a *Making Choices* activity for follow-up. Directions: I am going to group some items together that are all varieties of the same thing. You must name the group they have in common. For example, if I said, “peas, broccoli, and carrots,” you would say, “That’s a variety of vegetables.” Remember to answer in complete sentences.

1. almonds, pecans, walnuts (That’s a variety of nuts.)
2. apples, oranges, grapes (That’s a variety of fruits.)
3. yogurt, milk, cheese (That’s a variety of dairy products.)
4. fluoride, calcium, iron (That’s a variety of minerals.)
5. pork, beef, chicken (That’s a variety of meats.)



**Complete Remainder of the Lesson Later in the Day**



# A Well-Balanced Diet

8<sub>B</sub>

## Extensions

20 minutes

### Planning a Daily Balanced Diet

Divide students into small groups. Give each group three paper plates and a stack of food-oriented magazines with lots of pictures. Tell them that they are going to plan three meals together: breakfast, lunch, and dinner.

Students should:

1. Independently look in the magazines for pictures of foods that they would like to include, and cut them out;
2. Discuss food choices with one another, and make reasonable group decisions for each meal;
3. Include a drink with each meal;
4. Using a different paper plate for each meal, glue or tape pictures to the plates.

Once everyone has finished, gather the class together and have each group present its daily balanced diet to the class. Ask them to use the words carbohydrates, fats, and proteins when talking about their food choices. Display the plated menus in the room, and use these visuals for further discussions of healthy foods.

### ↔ Multiple Meaning Word Activity

#### **Definition Detective: Skip**

1. In the read-aloud you heard, “You may stumble over math problems, thinking five plus seven equals twenty, or *skip* over a line in your reader so that your sentences are all mumbo-jumbo.”
2. With your neighbor, think of as many meanings for the word *skip* as you can, or discuss ways you can use the word *skip*.

3. [Show Poster 4M (Skip).] Point to the picture on the poster that shows how the word *skip* is used in the lesson. [Have a student point to the correct picture for this sense of the word.] (one)
4. *Skip* also means other things. *Skip* can mean to move forward in a light or playful way by taking short, quick steps and jumps. [Have a student state the number of the picture that represents this sense of the word.] (two)
5. *Skip* also means to throw a flat stone along the surface of water so that it bounces. [Have a student state the number of the picture that represents this sense of the word.] (three)
6. Did you or your neighbor think of any of these definitions?
7. Now quiz your neighbor on the different meanings of *skip*. For example you could say, “It’s not a good idea to skip breakfast. Which *skip* am I?” And your neighbor should state the number of the picture that shows what kind of *skip* you meant.



# A Healthy Human Body

## 9

### ☒ **Lesson Objectives**

---

#### **Core Content Objectives**

---

Students will:

- ✓ Describe the relationship between cells, tissues, organs, and systems
- ✓ Identify the skeletal, muscular, circulatory, nervous, digestive, and excretory systems as important systems in 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 facts that support ways to live a healthy life (RI.2.8)
- ✓ Make personal connections in writing about how to begin the day, how to promote health, and how to end the day (W.2.8)
- ✓ Recount a personal experience involving the saying “get up on the wrong side of the bed” with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences (SL.2.4)
- ✓ Learn the meaning of common sayings and phrases such as to “get up on the wrong side of the bed” (L.2.6)
- ✓ Prior to listening to a read-aloud, orally identify what students know and have learned about the various body systems and how they keep us healthy

## Core Vocabulary

**calories, n.** Units used to measure the amount of energy in foods; the energy in food

*Example:* The foods we eat provide calories to fuel our bodies.

*Variation(s):* calorie

**network, n.** A group of interconnected things

*Example:* The human body is a network of complicated systems working together.

*Variation(s):* networks

**recovery, n.** A return to health

*Example:* Maria made a fairly quick recovery from the flu.

*Variation(s):* recoveries

**terms, n.** Words or phrases used to describe a thing or an idea


*Example:* Another term for *sweat* is *perspiration*.

*Variation(s):* term

**windpipe, n.** The air passage from the throat to the lungs; the trachea

*Example:* The windpipe and the esophagus are located next to each other, but serve very different functions.

*Variation(s):* windpipes

<i><b>At a Glance</b></i>	<b>Exercise</b>	<b>Materials</b>	<b>Minutes</b>
<i><b>Introducing the Read-Aloud</b></i>	<b>What Have We Already Learned?</b>	Poster 2 (Human Body Systems)	10
	<b>Purpose for Listening</b>		
<i><b>Presenting the Read-Aloud</b></i>	<b>A Healthy Human Body</b>	Poster 2; Poster 3 (Cells, Tissues, Organs, Systems)	15
<i><b>Discussing the Read-Aloud</b></i>	<b>Comprehension Questions</b>		10
	<b>Word Work: Recovery</b>		5
 <b>Complete Remainder of the Lesson Later in the Day</b>			
<i><b>Extensions</b></i>	<b>Sayings and Phrases: Get Up on the Wrong Side of the Bed</b>		5
	<b>Making Connections: A Healthy Body is Dependent Upon Healthy Systems and Healthy Systems are Dependent Upon Healthy Habits</b>	drawing paper, drawing tools	15





# A Healthy Human Body

# 9<sub>A</sub>

## Introducing the Read-Aloud

**10** minutes



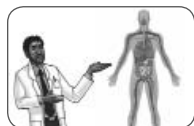
### What Have We Already Learned?

#### ◀ Show Image 9A-1: Diagram of the human body

What does it mean to be healthy? (not infected with disease; doing things that promote or indicate good health; strong; able) Point to Poster 2 (Human Body Systems) and ask students what it depicts. (human body systems) Ask students to identify the human body systems, and use one sentence to tell something about what each system does. (Answers may vary; skeletal—gives the body shape and helps the body move; muscular—allows the body to move and gives the body strength; circulatory—keeps blood flowing through our veins; nervous—sends messages between the brain and the body; digestive—keeps nutrients and gets rid of solid waste; excretory—gets rid of liquid waste)

### Purpose for Listening

Tell students they are going to review the functions of these body systems today and learn ways that they can help to make sure that their body systems continue to run smoothly and stay healthy. Ask them to listen carefully to find out the meaning of the word *calories*, how we burn calories, and why this is important to staying healthy.



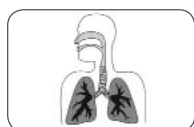
## A Healthy Human Body

### ◀ Show image 9A-1: Nick Nutri pointing at a diagram of a human body

Take a look at this, boys and girls. What are you looking at? Yes, you're looking inside a human body with all of its many complicated parts. Can you find the stomach and the intestines? Who sees the kidneys and the bladder? <sup>1</sup>

1 [Ask for volunteers to identify the various organs in the image.]

Today, we are going to review some of the things that you've learned about the human body and its **network**, or arrangement, of important systems. Let's start with the system you learned about last. Which system helps you sweat and pee? Yes, the excretory system. And, who remembers other **terms**, or words for sweat and pee? Yes, perspiration and urine. Have you tried using those terms with your family and friends?



### ◀ Show image 9A-2: Lung and windpipe

Which system is responsible for processing your food into nutrients that your body can use and getting rid of waste that it doesn't need? Yes, the digestive system. Raise your hand if you can tell me the name of the tube that carries food from the mouth to the stomach.

2 [Explain to students that the esophagus is not shown in this image. Explain that air travels down the windpipe through the nose or through the mouth.]

Great job—the esophagus is your food tube. We didn't talk about it, but there is another tube right beside it called the **windpipe**. It leads to your lungs. Can anyone guess what travels through your windpipe from your mouth to your lungs? It's something else that the body needs to live. Right—air! <sup>2</sup>

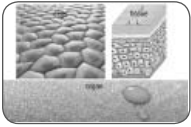


### ◀ Show image 9A-3: Muscular, skeletal, and circulatory systems

Look at the picture of the human body in this image. Look at all the bones that make up the skeleton. What's that system called? Oh, that was an easy one, wasn't it? The skeleton is part of the skeletal system. Here's another easy one. What system do muscles belong to? Yes, the muscular system. The skeletal and muscular systems work together to help you move.

Nerves are part of your nervous system. Look at Poster 2 (The Body Systems). Which one is the nervous system? Do you see the nerves running like highways across every part of the body, traveling up the spinal column, all the way to the brain?

Find the circulatory system on Poster 2. Don't confuse the nerves with veins and arteries, the tubes that carry blood through the body. The nervous system and the circulatory system look similar in the pictures. That's because blood covers a lot of territory, too. We've talked about nutrients and the way they travel through your blood to support your body systems. Without blood, these important substances would have no way to nourish your body. The circulatory system circulates, or moves, your blood.



← **Show image 9A-4: Cells, tissue, and organ**

3 [Point to the skin, then the tissue, and finally the cells as you read the following. Review Poster 3 (Cells, Tissues, Organs, and Systems) with students.]

4 [Encourage students to touch the skin of their arms and face.] The skin is an interesting organ because it covers the entire body, and it is the largest organ in the human body!



← **Show image 9A-5: Baked potatoes and French fries**

You know that each body system performs a separate function, and that each system is made up of organs.<sup>3</sup> Organs are made up of tissues, and tissues are made up of cells. From largest to smallest, the order is organs, tissues, then cells, which are the smallest. Let's think about skin as an example. Moving from the smallest part to the largest, skin cells combine to form skin tissues, and those tissues combine to form the skin as we see it. That's the way the human body works.<sup>4</sup>

It is important to keep your cells, tissues, organs, and body systems all running smoothly. You can do that in many different ways.

We've talked about the importance of making healthy food choices. Food gives you energy to grow, breathe, move, fight germs, and heal. Some foods have more nutrients in them than others. Choose a variety of foods, especially those high in nutrients. Choose frozen yogurt over ice cream. Choose a skinless chicken breast over fried chicken; a baked potato instead of French fries; a glass of low-fat milk instead of a chocolate milkshake.

Balance your daily diet with several servings of grains, fruits, and vegetables, and smaller portions of dairy, meat, and eggs.



← **Show image 9A-6: Produce**

5 Look at all the healthy fruits and vegetables in Nick Nutri's basket. Which is your favorite?

Remember to eat only a few sweets and fats. And don't forget that fresh food will give you lots more vitamins and minerals than packaged ones. So, head for the produce aisle or a local farmers' market and stock up on kale, broccoli, and pears.<sup>5</sup>

6 [Pause for suggestions.]

Besides eating a well-balanced diet, what other ways can you keep your body healthy?<sup>6</sup> Great suggestions!



← **Show image 9A-7: Exercise**

Exercise, or staying active, can help you maintain a healthy body weight. When you exercise, your body uses energy from the food you eat. The amount of energy that food provides to the human body is measured by **calories**. Food labels list the number of calories, or the amount of energy, in packaged foods, telling you how much energy is stored in them. You should eat enough food each day to provide your body with about the same amount of energy that it uses up during the day. If you eat too much and don't exercise, your body will store the extra food energy as fat. If you don't eat enough to satisfy your body's needs, your body will use its stored energy and you may lose weight.

You are burning energy all the time, even when you are sleeping, but your body uses much more energy to exercise than it does to sleep. If you weighed a hundred pounds, you would burn about forty calories just by standing still for thirty minutes, but if you walked for thirty minutes, you would burn about 120 calories. You would use up three times more energy by walking as you would by standing still for the same amount of time.

7 [You may want to record the numbers on chart paper and have students try to figure out the problem. (You would have to walk another ten minutes—forty minutes in all—to burn the additional forty calories in the bag of chips.  $120/30=4$  calories per minute)]

Here's a puzzle for you to solve. There are about 160 calories in a snack-size bag of potato chips. If you burn 120 calories by walking for thirty minutes, about how much longer would you need to walk to burn up all the calories in that bag of chips?<sup>7</sup> What type of exercise do you think might burn the calories even faster than walking?



← **Show image 9A-8: More exercise**

Exercise keeps your heart and lungs working well, fights off illness and disease, and builds strong bones. Make exercise a daily part of your life. Walk and cycle instead of getting in a car. Climb stairs instead of taking an elevator. Swim, play soccer, take karate, or gymnastics lessons, or shoot hoops with your buddies. All of these are good forms of exercise. Choose what you enjoy and have fun!<sup>8</sup>

8 What kinds of exercise do you enjoy?



← **Show image 9A-9: Good hygiene**

Keeping clean is another important part of staying healthy. There are many types of germs that can make you sick. Bacteria, the tiny, one-celled creatures that Anton van Leeuwenhoek studied, are one of the most common types of germs. Bacteria are everywhere. They are an important part of nature, and most bacteria are not your enemies. In fact, many bacteria live in your gut and help you digest your food.

But, millions more live on your skin, and some of them may be harmful. That's why it is important to wash your hands often and well. Wash them throughout the day, especially before eating. Besides hand washing, make sure that you clean every other part of your body, too. Take frequent showers and baths, shampoo often, and keep your fingernails short and clean. Brush your teeth regularly to get rid of old food and germs that feed on it. Use floss to keep your gums healthy and get rid of food stuck between your teeth.



← **Show image 9A-10: Regular habits**

Regular toilet habits are signs of good health. Most of the time you don't have to think too hard about these daily habits, but sometimes your body reacts and lets you know that you need to take extra care. Sometimes feces become hard and dry, making them difficult to pass. That is called constipation. With diarrhea, the opposite thing happens. Feces become loose and runny and

may signal an infection in the intestines. When waste systems do not function well, drinking lots of water usually helps. Make sure to listen to your body and the nerve signals that it sends to your brain. Don't put off using the bathroom when you need to go.



← **Show image 9A-11: Sleep**

How many of you wake up feeling tired in the morning? Has anyone ever asked you, “Did you get up on the wrong side of the bed?” If you're tired or grouchy when you wake up, that may mean that you are not getting all of the rest that your body needs. Most seven- or eight-year-olds need about ten or eleven hours of sleep each night. As you sleep, damaged body cells and tissues are repaired and replaced. If you are sick, sleep will help speed your **recovery**, or return to health.

Eating well, exercising, keeping clean, and getting enough rest are all good ways to keep your millions and billions and trillions of tiny cells working properly. You should also make sure to have regular checkups with a doctor or other health care professional.

I have loved sharing my knowledge of health and nutrition with you. Your body is yours alone, and you alone have the power to take care of it your whole life. Now that you know what to do to keep it in good condition, I hope you will treat it as well as you would any one of your favorite machines.



← **Show image 9A-12: The amazing human body**

I'm sure you'll agree that you'll never find another machine quite as amazing as the human body!

### Comprehension Questions

10 minutes

1. *Literal* What are calories? (ways of measuring energy in foods) What does it mean to burn calories? (use up energy) How do you know how many calories are in the foods you eat? (Calories are often listed on food packages. If not, there are charts to help you find out.)
2. *Inferential* If you eat about 2,500 calories a day every day for a month and only burn about 2,000 calories per day, will you be more likely to lose weight or gain weight? Why? (You will probably gain weight because your body is consuming far more energy than it is burning. You should try to balance the calories you take in with the calories you use up to maintain your weight.)
3. *Literal* What are some ways that you can prevent germs from infecting your body? (wash hands often; good hygiene habits—bathing, brushing teeth)
4. *Inferential* If the cells of one of your organs are diseased, can you still have healthy tissues and a healthy organ? (No, if cells are unhealthy, tissues will also be unhealthy because they are made up of cells, and the organ will be unhealthy because it is made up of tissues.)
5. *Inferential* Sometimes people laugh and talk while eating, and they begin to choke on their food. They cough it up and say, “It went down the wrong way.” What do they mean? (The food slipped into the windpipe instead of the esophagus.)

[Please continue to model the *Question? Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

6. *Evaluative What? Pair Share:* Pretend that you are sitting outside on a hot day reading a book. What body systems are at work as you read? (Answers may vary, but students should be aware that all body systems are working. Systems work together in a network, depending upon one another to keep the body healthy.)

7. After hearing today's read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

### Word Work: Recovery

5 minutes

1. In the read-aloud you heard, "If you are sick, sleep will help speed your *recovery*."
2. Say the word *recovery* with me.
3. *Recovery* means to return to health from an illness or injury.
4. Will made a complete recovery after breaking his leg.
5. Think of a time you made a recovery, and use the word *recovery* when you tell us about it. [Ask two or three students. If necessary, guide and/or rephrase students' responses: "With rest and time I made a recovery from . . ."]
6. What's the word we've been talking about?

Use a *Making Choices* activity for follow-up. Directions: I am going to give some examples. If it is an example describing a recovery, say, "That is a recovery." If it is not an example of recovery, say, "That is not a recovery." Remember to answer in complete sentences.

1. Keisha missed several days of school, but she still had a fever when she woke up this morning so she missed another day. (That is not a recovery.)
2. Felicity caught the chicken pox, was home for a week, and when she went back to school she was completely healed. (That is a recovery.)
3. Even after seeing the physical therapist twice a week for a month, Pierre's elbow still ached. (That is not a recovery.)
4. After a long night at the hospital, Dr. Simon took a nap and felt as good as new. (That is a recovery.)



### Complete Remainder of the Lesson Later in the Day





# A Healthy Human Body

9<sub>B</sub>

## Extensions

20 minutes

### Sayings and Phrases: Get Up on the Wrong Side of the Bed 5 minutes

Proverbs are short, traditional sayings that have been passed along orally from generation to generation. These sayings usually express general truths based on experiences and observations of everyday life. While some proverbs do have literal meanings—that is, they mean exactly what they say—many proverbs have a richer meaning beyond the literal level. It is important to help your students understand the difference between the literal meanings of the words and their implied or figurative meanings.

Ask students if they have ever heard anyone say “She got up on the wrong side of the bed” or “Did he get up on the wrong side of the bed?” Have students repeat the proverb “get up on the wrong side of the bed.” Explain that this proverb is another way of saying that someone woke up in a bad mood and is acting grouchy or mean.

Ask students if they have ever woken up in a bad mood and stayed grouchy for a while. Tell students that instead of saying “I’m in a really bad mood,” they could say “I got up on the wrong side of the bed.” Give students the opportunity to share their experiences, and encourage them to use the saying.

Remind students that in today’s read-aloud, one possible reason was given for why someone might get up on the wrong side of the bed. What might that reason be? (not getting enough sleep) Look for more opportunities to use this saying in the classroom.

## **Making Connections: A Healthy Body is Dependent Upon Healthy Systems and Healthy Systems are Dependent Upon Healthy Habits**

**15** *minutes*

Ask students to write a paragraph or two describing a day in which they do everything they can to stay healthy. Ask, “How would you begin the day? What would you do to promote health during the day?” and “How would you end the day?” (Answers may vary, but should include healthy foods, cleanliness, exercise, and adequate rest.)



# Domain Review

**DR**

## ***Note to Teacher***

---

You should spend one day reviewing and reinforcing the material in this domain. You may have students do any combination of the activities provided, in either whole-group or small-group settings.

## ***Core Content Objectives Addressed in This Domain***

---

Students will:

- ✓ Identify the five senses and associated body parts
- ✓ Identify the skeletal, muscular, circulatory, nervous, digestive, and excretory systems as important systems in the human body
- ✓ Describe the significant contributions of Anton van Leeuwenhoek
- ✓ Explain that all living things are made of microscopic cells
- ✓ Describe the relationship between cells, tissues, organs, and systems
- ✓ Identify important components of the digestive system and their functions
- ✓ Describe the process of nourishing the body from the time food is taken into the mouth until waste is removed from the body
- ✓ Identify important components of the excretory system and their functions
- ✓ Describe how the digestive and excretory systems work together
- ✓ Explain the importance of vitamins and minerals to the body
- ✓ Explain the importance of eating a balanced diet
- ✓ Classify foods as healthy or unhealthy
- ✓ Plan a daily balanced diet

## Activities

---

### Riddles for Core Content

---

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

- Many human organs are inside the body, but all of your sense organs (that's us) are visible. What are we? (eyes, ears, nose, tongue, skin)
- I lived many hundreds of years ago in a small Dutch village. My curiosity led me to the naming of microscopic cells. Who am I? (Anton van Leeuwenhoek)
- The urethra and two ureters carry urine out of your body. These three tubes are all part of my system. What am I? (the excretory system)
- What is the name of the tube, located near the windpipe, that takes food from the throat to the stomach? (esophagus)
- I am a particularly important nutrient in the first two years of life, but after that you need to limit how much of me you consume. What am I? (fats)
- We are two nutrients that are important to the body, but we are needed in smaller quantities than proteins, fats, and carbohydrates. What are we? (vitamins and minerals)
- I am a liquid that is vitally important to all life on Earth. What am I? (water)
- I am a favorite snack food made from potatoes and fried in oil. I am sold at many fast food restaurants, but it would be unhealthy to eat me every day. What am I? (French fries)
- We are made up of cells and tissues and work within body systems. We include both the heart and the brain. What are we? (organs)

### Image Review

---

You may show the Flip Book images from any read-aloud again and have students retell the read-aloud using the images.

## Image Card Review

---

### **Materials: Image Cards 8–13**

Hold Image Cards 8–13 in your hand, fanned out like a deck of cards. Hand one card to each of six students. Students must then look at their cards and figure out the correct sequence for the digestive process. Ask them to stand in the proper order, facing the others so that they may give their input as well.

## Domain-Related Trade Book or Student Choice

---

### **Materials: Trade book**

Read a trade book to review a particular domain-related topic; refer to the books listed in the Introduction. You may also choose to have students select a read-aloud to be heard again.

## Key Vocabulary Brainstorming

---

### **Materials: Chart paper, chalkboard, or whiteboard**

Give students a key vocabulary word such as *fats*. Have them brainstorm everything that comes to mind when they hear the word, such as, “Too many fats will make you fat.” Record their responses on chart paper, a chalkboard, or a whiteboard for easy reference.

## Audio-Visual Reinforcement of the Digestive System

---

**Materials: Internet connection; audio/visual equipment. [May require advance preparation if needed equipment is not already present in the classroom.]**

Present a video about the digestive process. The following link to a video on YouTube is a suggestion for an age-appropriate video that may be of interest.

<http://www.youtube.com/watch?v=08VyJOEcDos>

## **Class Book: Eating Our Way to Health—What Foods a Healthy Body Needs**

---

### **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 important nutritional information that they have learned in this domain. Have students brainstorm which nutrients humans need and which foods supply those nutrients. Have each student choose one food to draw a picture of and then write a caption for the picture, including which important nutrients that food supplies for the growth of a healthy human body.

Bind the pages to make a book to put in the class library for students to read again and again

- ✦ Above and Beyond: Those students who are ready to do so, may contribute multiple illustrations and captions, or they may plan an organized structure for the book (for example, categorized by food group, color, or important nutrients).



# Domain Assessment

# DA

This domain assessment evaluates each student's retention of domain and academic vocabulary words and the core content targeted in *The Human Body: Building Blocks and Nutrition*. The results should guide review and remediation the following day.

There are four parts to this assessment. You may choose to do the parts in more than one sitting if you feel this is more appropriate for your students. Part I (vocabulary assessment) is divided into two sections: the first assesses domain-related vocabulary, and the second assesses academic vocabulary. Parts II, III, and IV of the assessment address the core content targeted in *The Human Body: Building Blocks and Nutrition*.

## 10 Part I (Instructional Master DA-1)

Directions: I am going to say a sentence using a word you have heard in the read-alouds. First, I will say the word and then use it in a sentence. If I use the word correctly in my sentence, circle the smiling face. If I do not use the word correctly in my sentence, circle the frowning face. I will say each sentence two times. Let's do number one together.

1. **Liver:** The liver, located in your throat, is one of your least important organs. (frowning face)
2. **Saliva:** Saliva is the fluid that leaves your body through the urethra. (frowning face)
3. **Cells:** Your body is made up of cells that are so small that they must be viewed through a microscope. (smiling face)
4. **Intestines:** Your large and small intestines are both part of the same long tube. (smiling face)
5. **Bladder:** The bladder is where feces stay until they are ready to leave the body. (frowning face)
6. **Nutrition:** Poor nutrition is never a problem for people with money. (frowning face)

7. **Carbohydrates:** Carbohydrates are the main energy source for the body. (smiling face)
8. **Minerals:** Milk provides calcium, an important mineral for the body. (smiling face)
9. **Nutritionist:** Nutritionists believe it's ok to eat lots of fats and sugar instead of fruits, vegetables, and protein. (frowning face)
10. **Kidney:** Kidneys work within the excretory system to balance the amount of water in the body. (smiling face)

Directions: I am going to read several sentences about the human body you have recently heard. If what I describe in the sentence is correct, circle the smiling face. If what I describe in the sentence is not correct, circle the frowning face.

11. **Systems:** The digestive and excretory systems are two of the human body's systems. (smiling face)
12. **Absorb:** The villi inside the small intestine absorb nutrients into the body. (smiling face)
13. **Moderation:** Starving yourself or overeating are examples of moderation. (frowning face)
14. **Nourish:** Foods such as fast food burgers, fries, candy, and cookies nourish the body. (frowning face)
15. **Essential:** A well-balanced diet, plenty of rest, and regular exercise are essential to good health. (smiling face)

## 10 Part II (Instructional Master DA-2)

For each row of pictures you will be asked to look for specific things. Follow my directions carefully. In some instances there may be more than one right answer and you may circle more than one picture. We will do the first one together.

1. Look at the pictures in the first row. How are these pictures alike? (They are all pictures of tools with lenses that magnify objects.) The first picture is a picture of a telescope. The next picture is a picture of a modern microscope. The third picture shows a hand lens or magnifying glass, and the fourth picture shows an early microscope. Anton van Leeuwenhoek made



many microscopes to study living cells. Circle the picture that looks most like the microscopes he made over 400 years ago. Which picture should you circle? Draw a circle around the fourth picture, the simplest microscope shown. (4)

2. Van Leeuwenhoek described bacteria, tiny one-celled organisms that sometimes cause disease. Circle the picture(s) of places where bacteria live. You may circle more than one. (1, 2, 3, 4)
3. Human body systems are made up of organs. All organs have important functions, but we can live without some of our organs. Circle the organ pictured that, although very important, is not vital to life. You will not die if you lose this organ. (4)
4. The digestion of your food involves different organs. Circle the sense organ that is responsible for helping food begin its journey through your body. (3)
5. Food passes from the mouth to the esophagus. Circle the organ that receives the food when it leaves the esophagus. (4)
6. Both the digestive system and the excretory system have places to hold waste before it leaves the body. Solid waste is held in the rectum. Circle the organ that holds liquid waste. (1)
7. If you eat a healthy diet, you will get most of the nutrients that your body needs, including vitamins and minerals. Circle the most healthy, nutritious food choice(s). You may circle more than one. (2, 4)
8. Your doctor has told you to eat fewer fats and less sugar. Which of the following meals should you choose to follow the doctor's advice? You may circle more than one. (2, 3)
9. Small, finger-like villi absorb nutrients. Circle the digestive organ in which villi are found. (3)
10. Your liver cleans your blood. Circle the picture of a common household object that functions most like your liver. (1)

### 10 Part III (Instructional Master DA-3)

---

Choose the correct term from the word bank below that describes what the images are, and write the term in the blank provided.

1. These are \_\_\_\_\_. (systems)
2. These are \_\_\_\_\_. (tissues)
3. These are \_\_\_\_\_. (cells)
4. These are \_\_\_\_\_. (organs)

### 10 Part IV (Instructional Master DA-4)

---

Directions: Write a few words, phrases, or sentences to answer each question or statement.

**Note:** You may need to have some students respond orally if they are not able to respond in writing.

1. Explain what the digestive system does, and what some of the organs in the digestive system do.
2. Explain what the excretory system does, and what some of the organs in the excretory system do.
3. What should you eat to keep a well-balanced diet?
4. What are some things you can do to stay healthy?



# Culminating Activities

# CA

## **Note to Teacher**

---

Please use this final day to address class results of the Domain Assessment. Based on the results of the Domain Assessment and students' Tens scores, you may wish to use this class time to provide remediation opportunities that target specific areas of weakness for individual students, small groups, or the whole class.

Alternatively, you may also choose to use this class time to extend or enrich students' experience with domain knowledge. A number of enrichment activities are provided below in order to provide students with opportunities to enliven their experiences with domain concepts.

## **Remediation**

---

You may choose to regroup students according to particular areas of weakness, as indicated from Domain Assessment results and students' Tens scores.

Remediation opportunities include:

- targeting Review Activities
- revisiting lesson Extensions
- rereading and discussing select read-alouds
- reading the corresponding lesson in the *Supplemental Guide*, if available

## **Enrichment**

---

### **Guest Presenter**

---

Invite a nutritionist to come talk to the class about healthy foods and healthy eating habits.

## Making a Simple Magnifying Glass

---

**Materials:** Clear plastic bottle; dry marker pen; scissors; water

Directions:

1. Draw a circle shape at the neck of the bottle. It is important that it is at the neck so that it creates a disc shape.
2. Cut out the circle.
3. Pour a drop of water into the disc.
4. Hold it over a book and watch the letters get bigger.

The science simply explained:

The disc shape curves outward, forming a convex shape. By adding the water, the light that passes through it is refracted, or bent inwards, creating a lens effect and enlarging the size of the letters.

## Reading Food Labels

---

Collect or have students bring packaged food labels to class. Divide students into groups, and give each group a handful of labels. Ask them to plan a well-balanced meal from the foods they are given. Have them record various findings: sodium content, added sugars, vitamins, calories, etc., and hold a discussion to see if they are indeed able to put together a well-balanced meal from packaged food.

## Round-Robin Storytelling of Food's Journey

---

Display a chart or image of the digestive system. Have students sit in a circle, and tell them that they are going to make up the tale of a piece of food on its journey through the digestive tract. Ask for a volunteer to begin the tale, for example, "I opened my mouth and put a cube of cheese into its opening". Proceed around the circle, having each student add a sentence: "My teeth crushed the cheese . . . Saliva swirled around my mouth and softened the cheese . . . As I chewed the cheese formed a lump of food" and so on. You may want to hand out random cue cards with words written on them (*saliva*, *esophagus*, etc.) rather than going in order around the circle. This will facilitate the telling of the story—making sure every step in the process is included—and keep students more involved, awaiting their turns.

**For Teacher Reference Only:**  
Copies of *Tell It Again! Workbook*







Dear Family Member,

Over the next few days, your child will be learning about the human body systems and their important parts—organs, tissues, and cells. He/she will learn about the discovery of human cells. Below are some suggestions for home activities to reinforce your child's own observations and discoveries.

### 1. Sense Organs

Reinforce your child's previous knowledge of the five senses by talking about the organs responsible for each one: eyes, nose, tongue, ears, and skin. Ask your child to tell you which organ is the largest body organ (skin).

### 2. Examining Objects Closely

If possible, provide your child with a magnifying glass. Encourage him/her to examine, draw, and label common objects in the environment.

### 3. Words to Use

Below is a list of some of the words that your child will be using at school. Try to use these words as they come up in everyday speech with your child.

- *Nutrition*—Reading nutrition labels can help you select the right foods to eat.
- *Magnify*—Microscopes magnify, or enlarge, microscopic organisms.
- *Stomach*—When the digestive system is upset, your stomach may ache.
- *Vaccinations*—Vaccinations prevent many children from getting once-common diseases.

### 4. Finding Everyday Lenses

Talk about the everyday use of lenses, and look for different kinds of lenses together: eyeglasses, contact lenses, telescopes, microscopes, binoculars, cell phone/cameras, digital cameras, and car headlights.

### **5. Read Aloud Each Day**

It is very important that you read to your child each day. The local library has numerous books on the human body and nutrition that you may share with your child. A list of books and other relevant resources is attached to this letter.

Be sure to let your child know how much you enjoy hearing about what s/he has learned at school.



## ***Recommended Trade Books for The Human Body: Building Blocks and Nutrition***

---

### **Trade Book List**

---

1. *Bones: Our Skeletal System*, by Seymour Simon (HarperCollins, 2000) ISBN 978-0688177218
2. *The Bones Book and Skeleton*, by Stephen Cumbaa (Workman Publishing Company, 2006) ISBN 978-0761142188
3. *The Brain: Our Nervous System*, by Seymour Simon (HarperCollins, 2006) ISBN 978-0060877194
4. *Cells, Tissues, and Organs*, by Richard Spilsbury (Heinemann Library, 2008) ISBN 978-1432909048
5. *The Digestive System*, by Rebecca L. Johnson (Lerner Publications Company, 2005) ISBN 978-0822512479
6. *The Digestive System*, by Kirstin Petrie MS, RD (ABDO Publishing Company, 2007) ISBN 978-159679710
7. *The Digestive System*, by Christine Taylor-Butler (Scholastic Inc., 2008) ISBN 978-0531207314
8. *Dinosaurs Alive and Well!: A Guide to Good Health*, by Marc Brown and Laurie Krasny Brown (Little, Brown Books for Young Readers, 1992) ISBN 978-0316110099
9. *The Dynamic Digestive System: How Does My Stomach Work?*, by John Burnstein (Crabtree Publishing Company, 2009) ISBN 978-0778744290
10. *The Edible Pyramid: Good Eating Every Day*, by Loreen Leedy (Holiday House, 1994) ISBN 978-0823420742
11. *Food and Digestion*, by Andrew Solway (Sea-to-Sea Publications, 2011) ISBN 978-1597712644
12. *Good Enough to Eat: A Kid's Guide to Food and Nutrition*, by Lizzy Rockwell (HarperCollins, 2009) ISBN 978-0064451741

13. *Greg's Microscope*, by Millicent E. Selsam, illustrated by Arnold Lobel (HarperCollins, 1990) ISBN 978-0064441445
14. *Gurgles and Growls: Learning About Your Stomach*, by Pamela Hill Nettleton (Picture Window Books, 2004) ISBN 978-1404805040
15. *Guts: Our Digestive System*, by Seymour Simon (HarperCollins Publishers, 2005) ISBN 978-0060546519
16. *The Human Body*, by Seymour Simon (Collins, 2008) ISBN 978-0060555412
17. *The Magic School Bus: Inside the Human Body*, by Joanna Cole, illustrated by Bruce Degen (Scholastic Audio Books, 2011) ISBN 978-0545240833
18. *Muscles: Our Muscular System*, by Seymour Simon (HarperCollins, 2000) ISBN 978-0688177201
19. *My Food Pyramid: Eat Right. Exercise. Have Fun.*, by Alisha Niehaus (Dorling Kindersley Limited, 2007) ISBN 978-0756629939
20. *My Organ Buddies*, by Lee Downing and Felice Downing (Organ Buddies, Inc, 2010) ISBN 978-0615329406
21. *Parts*, by Tedd Arnold (Puffin, 2000) ISBN 978-0140565331
22. *The Race Against Junk Food (Adventures in Good Nutrition)*, by Anthony Buono and Roy Nemerson (HCOM Inc., 1997) ISBN 978-0965810807
23. *The Quest to Digest*, by Mary K. Corcoran (Charlesbridge, 2006) ISBN 978-1570916649
24. *Ultra-Organized Cell Systems*, by Rebecca L. Johnson (Millbrook Press, 2008) ISBN 978-0822571384
25. *What Am I Made Of?*, by David Bennett, illustrated by Stuart Trotter (Aladdin Paperbacks, 1991) ISBN 978-0689714900
26. *Where Does Your Food Go?*, by Wiley Blevins (Scholastic Inc., 2003) ISBN 978-0516258607

## Websites and Other Resources

---

### *Student Resources*

1. **How the Human Body Works (various systems)**  
[http://kidshealth.org/kid/htbw/htbw\\_main\\_page.html](http://kidshealth.org/kid/htbw/htbw_main_page.html)
2. **Human Body Systems Game**  
<http://sciencenetlinks.com/media/filer/2011/10/13/allsystems.swf>
3. **I Know That**  
<http://www.iknowthat.com/com/L3?Area=Science%20Lab>
4. **Mission Nutrition**  
[http://kidshealth.org/kid/games/mission\\_nutrition.html#cat20918](http://kidshealth.org/kid/games/mission_nutrition.html#cat20918)
5. **A Ride Through the Human Body**  
<http://www.healthexplorationstation.com/fun/hes2.htm>
6. **Science Interactive Body**  
[http://www.bbc.co.uk/science/humanbody/body/interactives/3djigsaw\\_02/index.shtml?muscles](http://www.bbc.co.uk/science/humanbody/body/interactives/3djigsaw_02/index.shtml?muscles)

### *Family Resources*

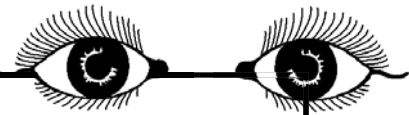
7. **Discovery Kids: Your Digestive System**  
<http://kids.discovery.com/tell-me/science/body-systems/your-digestive-system>
8. **Enchanted Learning**  
<http://www.enchantedlearning.com/subjects/anatomy/digestive/>
9. **Ducksters: Science for Kids**  
[http://www.ducksters.com/science/digestive\\_system.php](http://www.ducksters.com/science/digestive_system.php)
10. **History of the Microscope**  
<http://www.history-of-the-microscope.org/anton-van-leeuwenhoek-microscope-history.php>
11. **Scholastic: Human Body**  
<http://www.scholastic.com/teachers/unit/human-body-everything-you-need>



## Using a Magnifying Glass

Directions: Look at the fabric swatch you have been given without using the magnifying glass. Draw what you see under the heading "What I See With My Eyes Alone." Then, look at the fabric swatch using the magnifying glass, and draw what you see under the heading "What I See Through the Magnifying Glass."

### What I See With My Eyes Alone



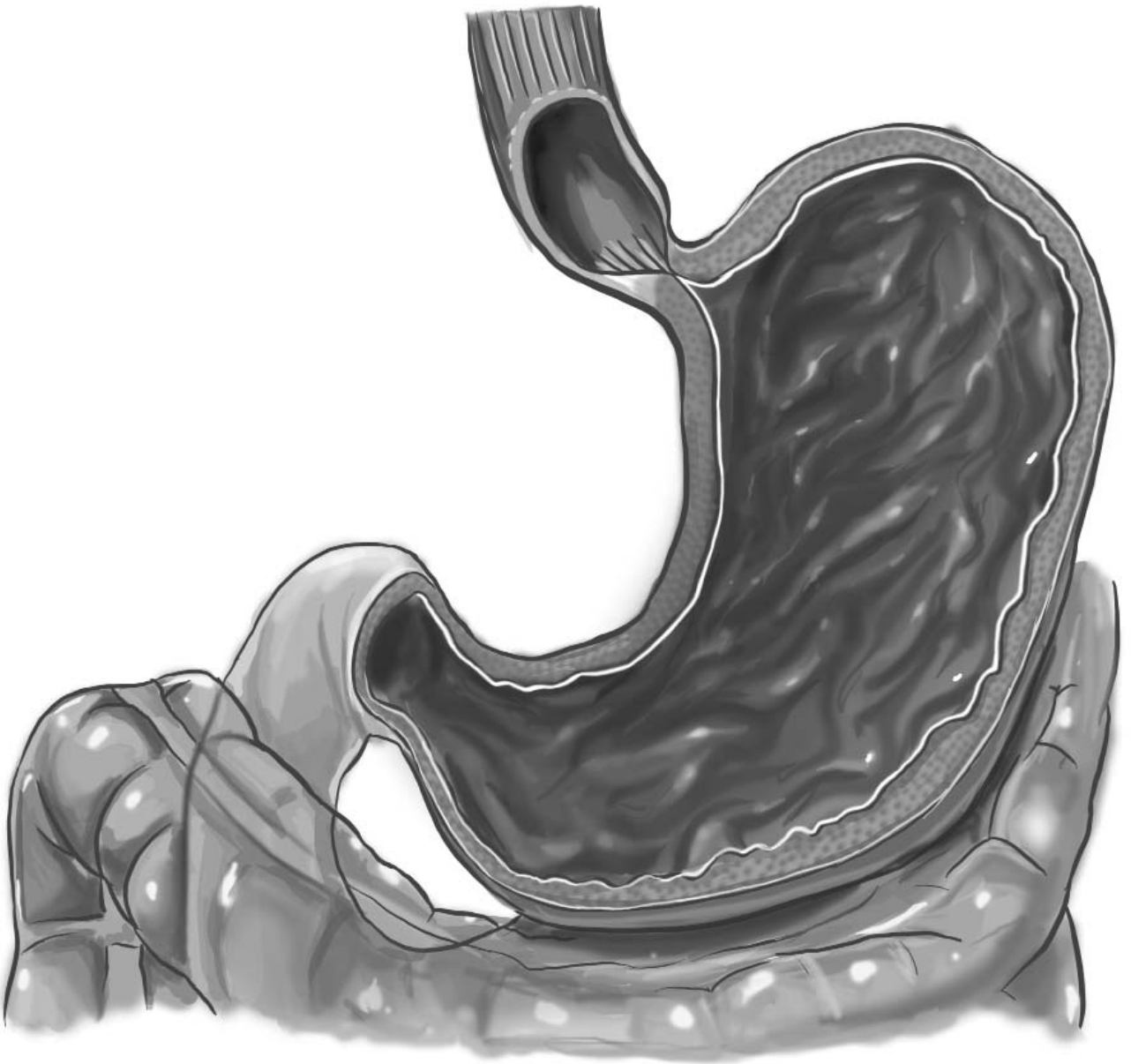
### What I See Through the Magnifying Glass





## Stomach Tissues

Directions: Glue or tape tissues to the image of the stomach to show the different kinds of tissue that make up the organ: the stomach. The order of tissue will go from the inside to the outside of the stomach. Keep track of which color you use for which kind of tissue. First glue or tape the epithelial tissue to the stomach. Second is the connective tissue. Third is muscular tissue. And fourth is nervous tissue. Color the names of tissue in the boxes below the drawing to match the color of tissue paper glued or taped to the stomach.



Epithelial	Connective
Muscle	Nervous





Directions: Read the statements below and put an X beside the statement that best describes Anton's contribution to the world.

## Anton van Leeuwenhoek



- \_\_\_ He invented the microscope.
- \_\_\_ He wrote a book called *Micrographia*.
- \_\_\_ He was the first person to describe bacteria.
- \_\_\_ He made cloth from tiny animal hairs.

## Cells, Tissues, Organs, Systems

cells	tissues	organs	systems	
function	connective	muscle	epithelial	nervous

1. The smallest units of human life are called \_\_\_\_\_.
2. Tissues are made up of similar \_\_\_\_\_.
3. Organs are made up of \_\_\_\_\_.
4. Your heart is one of your most important \_\_\_\_\_.
5. The tissue that forms protective barriers is called \_\_\_\_\_ tissue.
6. Blood, bone, and fat are all \_\_\_\_\_ tissues.
7. Body systems are made up of different \_\_\_\_\_.
8. Every organ in the body has a special job, or \_\_\_\_\_.
9. The digestive and excretory \_\_\_\_\_ process your food and waste.

Directions: Choose the word from the word bank that goes with the sentence, and write it in the blank. Not all words in the word bank are used.

Directions: Read the statements below and put an X beside the statement that best describes Anton's contribution to the world.

## Anton van Leeuwenhoek



- \_\_\_ He invented the microscope.
- \_\_\_ He wrote a book called *Micrographia*.
- X He was the first person to describe bacteria.
- \_\_\_ He made cloth from tiny animal hairs.

## Cells, Tissues, Organs, Systems

cells	tissues	organs	systems	
function	connective	muscle	epithelial	nervous

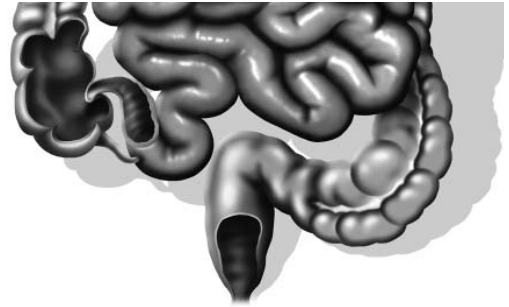
1. The smallest units of human life are called cells.
2. Tissues are made up of similar cells.
3. Organs are made up of tissue.
4. Your heart is one of your most important organs.
5. The tissue that forms protective barriers is called epithelial tissue.
6. Blood, bone, and fat are all connective tissues.
7. Body systems are made up of different organs.
8. Every organ in the body has a special job, or function.
9. The digestive and excretory systems process your food and waste.

Directions: Choose the word from the word bank that goes with the sentence, and write it in the blank. Not all words in the word bank are used.

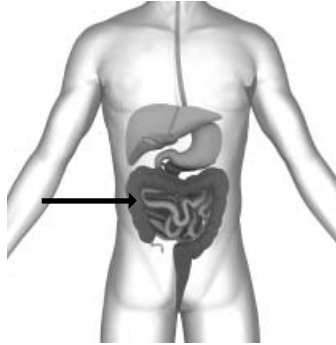
Directions: The following pictures show the different steps in the process of digestion. Number each one in the correct order from 1–6, following food from the mouth to the anus.


☐

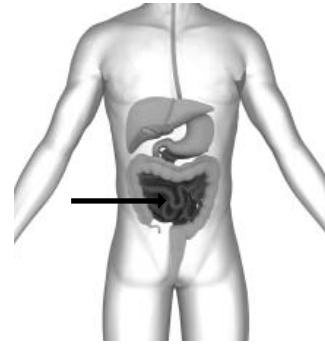
Teeth crush the food, and saliva softens it into a mashed up lump of food.


☐

Feces, or waste, is stored in the rectum until it is ready to be passed out of the body through the anus.


☐

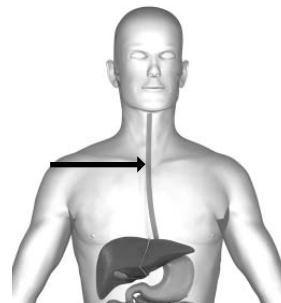
Food enters the large intestine, where water is absorbed from the waste and passed into the bloodstream.


☐

Food enters the small intestine, where millions of tiny villi absorb its nutrients.


☐

Food enters the stomach, where it is broken down by gastric juices into a paste-like substance.


☐

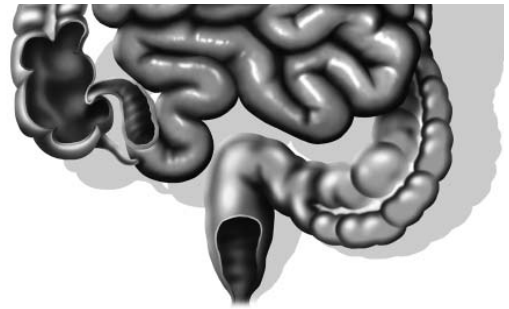
The lump of food travels down a stretchy tube called the esophagus.



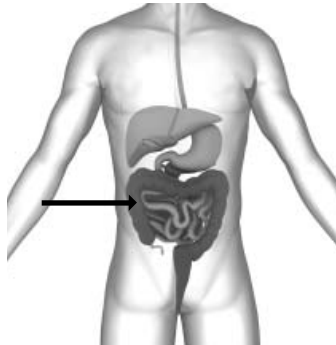
Directions: The following pictures show the different steps in the process of digestion. Number each one in the correct order from 1–6, following food from the mouth to the anus.

**1**

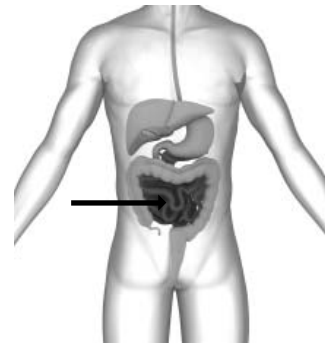
Teeth crush the food, and saliva softens it into a mashed up lump of food.

**6**

Feces, or waste, is stored in the rectum until it is ready to be passed out of the body through the anus.

**5**

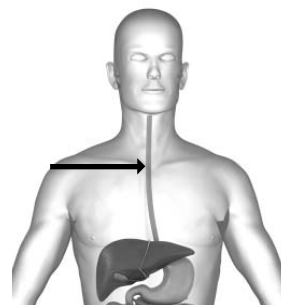
Food enters the large intestine, where water is absorbed from the waste and passed into the bloodstream.

**4**

Food enters the small intestine, where millions of tiny villi absorb its nutrients.

**3**

Food enters the stomach, where it is broken down by gastric juices into a paste-like substance.

**2**

The lump of food travels down a stretchy tube called the esophagus.





## Digestive System Matchup

stomach

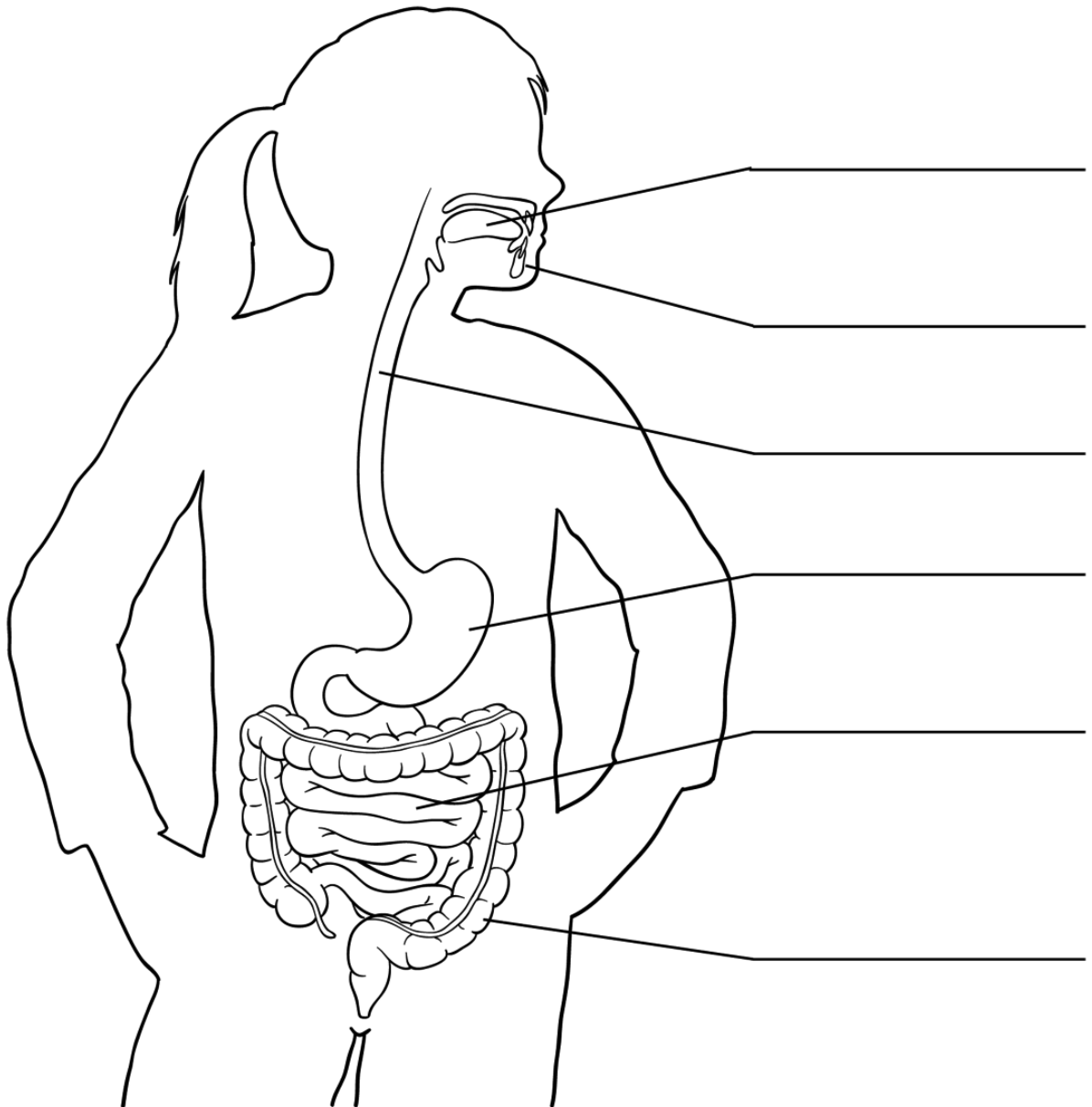
large intestine

esophagus

tongue

small intestine

teeth



Directions: Label the parts of the digestive system using the terms provided in the word bank.



**Digestive System Matchup**

stomach

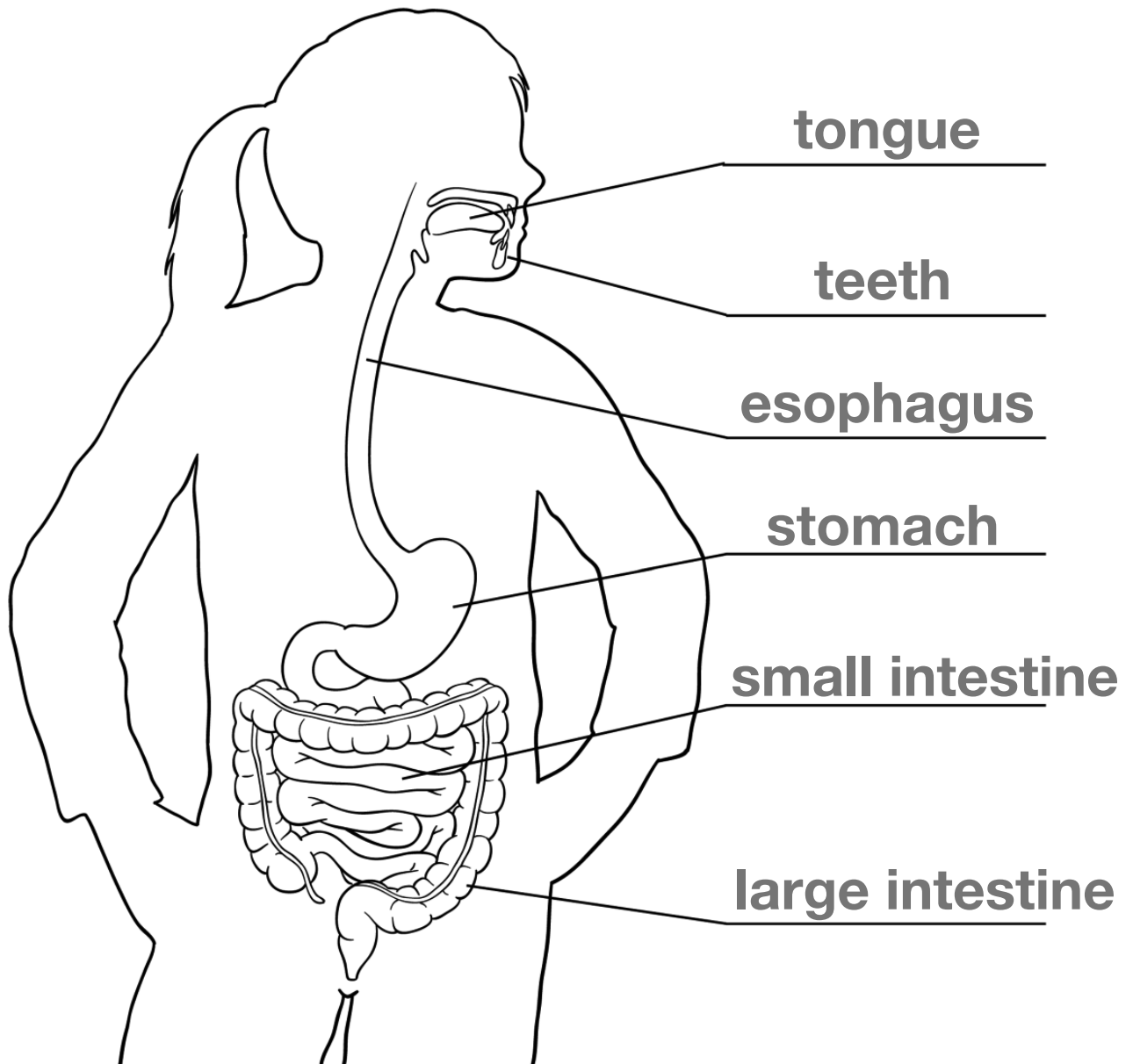
large intestine

esophagus

tongue

small intestine

teeth



Directions: Label the parts of the digestive system using the terms provided in the word bank.





Dear Family Member,

Your child is learning about the digestive system and the excretory system, the two body systems that process our food and help us get rid of wastes. Over the next few days s/he will learn the importance of keeping bodies healthy by eating nutritional foods. Below are some suggestions for activities that you can do at home to reinforce your child's learning about these important systems and the foods that supply our bodies with the most nutrients.

### **1. How Long Are My Intestines?**

The large and small intestines combined are about 25 feet long. Using a tape measure, help your child find objects or measure distances that are of a similar length. This will reinforce an incredible fact about this lengthy digestive organ!

### **2. A Fact-Finding Trip to the Grocery Store**

Spend additional time in the produce section during a regular visit to the grocery store. Ask your child to find a fruit or vegetable that is unfamiliar to him/her. Identify the item, and, if it is not too expensive, buy one to try. Find out more about its origins and nutritional value by looking it up in a book or online. Another fun and informative grocery store activity for you and your child is to read package labels, making healthy meal selections based on good nutritional content—those foods that are low in sodium, sugars, and fats.

### **3. Words to Use**

Your child has learned technical terms for discussing the body. Try to use these words as they come up in everyday speech with your child.

- *Excrete*—One way our bodies excrete, or get rid of, waste is through our skin.
- *Digest*—It is important to eat slowly in order to digest our food well.
- *Perspire/perspiration*—I perspire, or sweat, on a hot day.
- *Urine/urination*—Urine is made up largely of water.

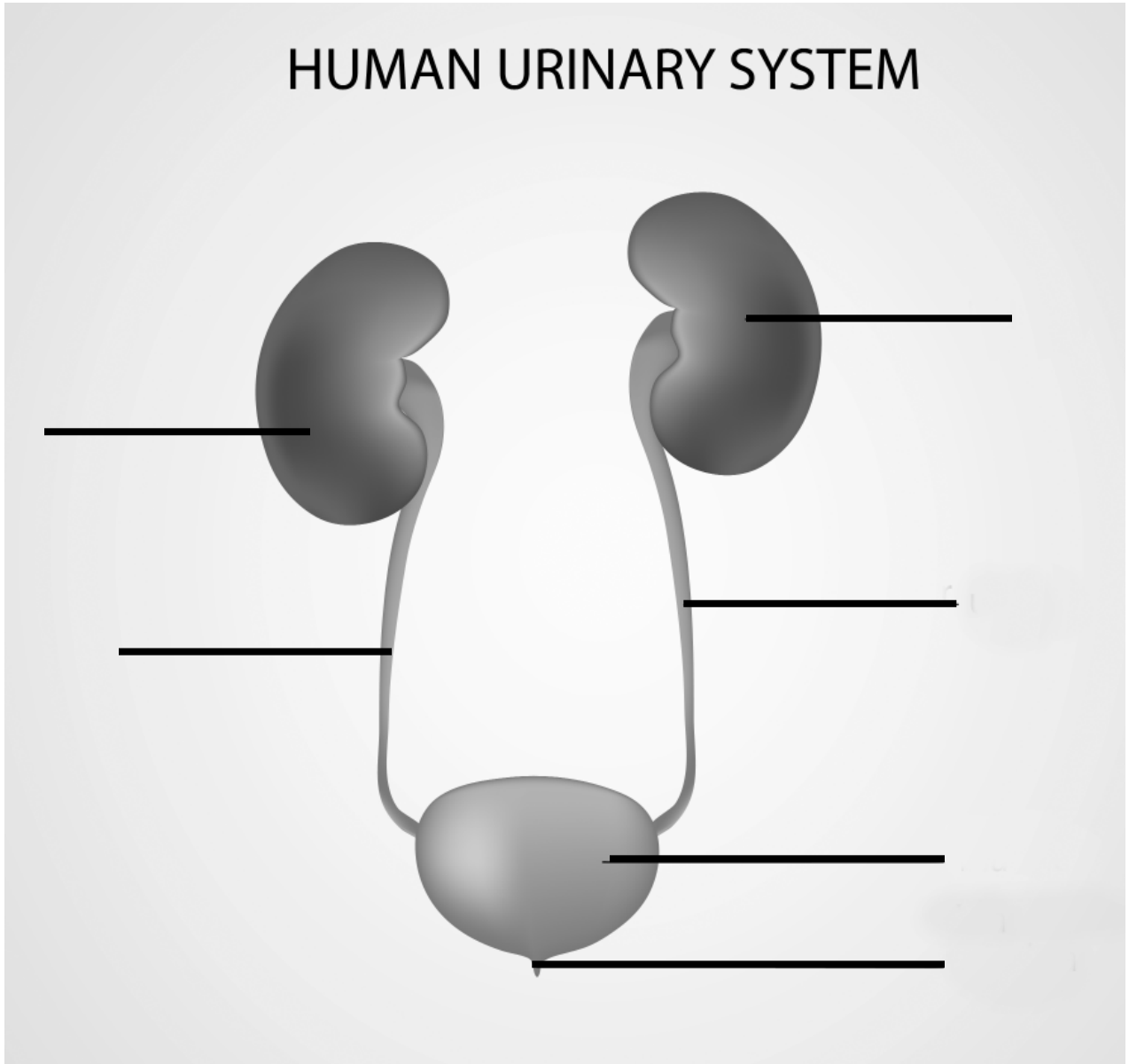
### **4. Read Aloud Each Day**

It is very important that you read to your child each day. The local library has numerous books on nutrition that you may share with your child. A list of books and other relevant resources was attached to the previous letter.

Be sure to let your child know how much you enjoy hearing about what s/he has learned at school.



Directions: Glue of tape kidney beans over the left and right kidneys. Glue or tape string to form the ureters. Glue or tape a balloon over the bladder with the air hole facing down (the urethra). Once the picture is complete, use the words at the bottom of the page to label each part correctly. The words kidney and ureter are each used twice.

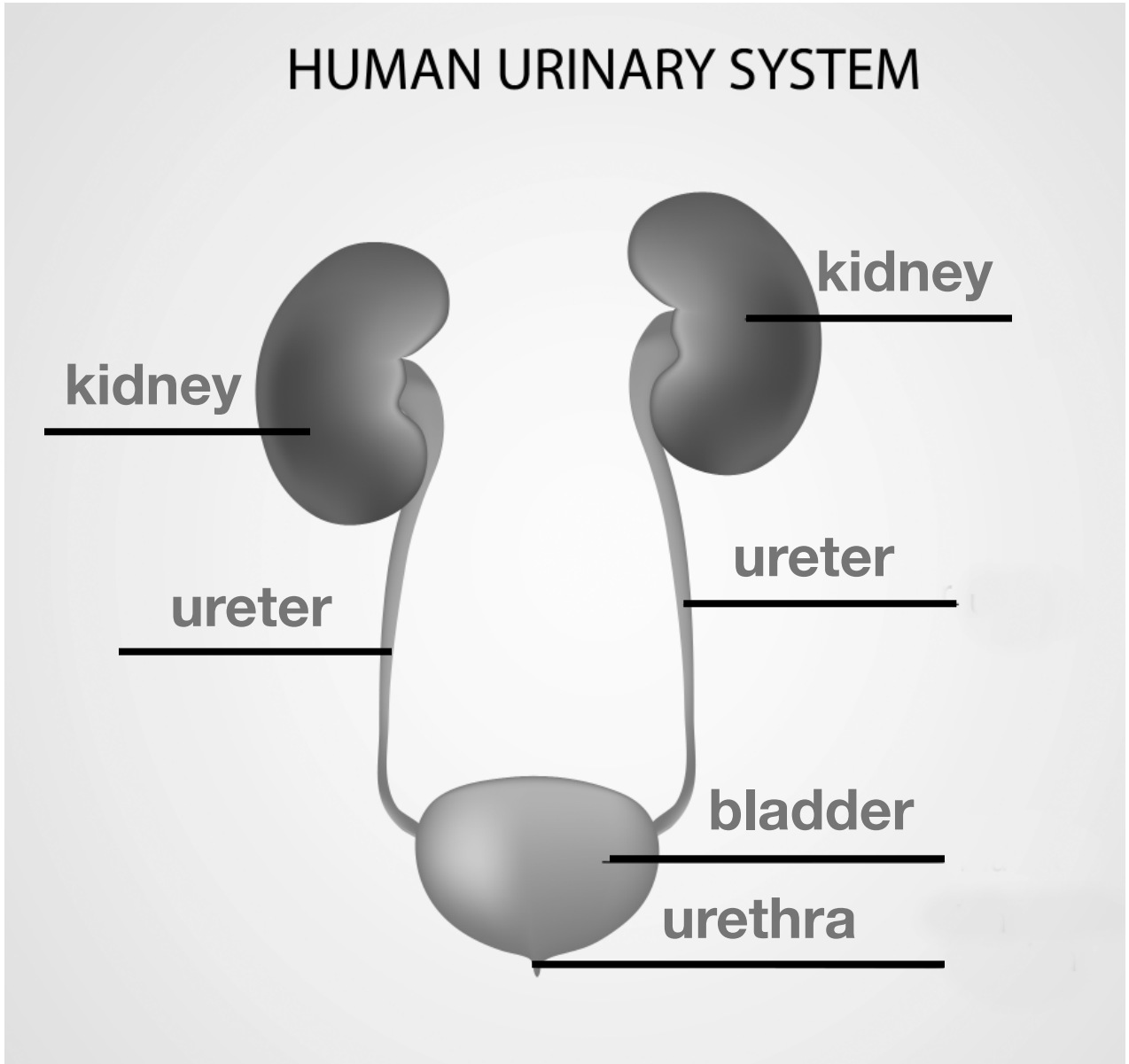


ureter	bladder
kidney	urethra





Directions: Glue of tape kidney beans over the left and right kidneys. Glue or tape string to form the ureters. Glue or tape a balloon over the bladder with the air hole facing down (the urethra). Once the picture is complete, use the words at the bottom of the page to label each part correctly. The words kidney and ureter are each used twice.



ureter	bladder
kidney	urethra



Directions: Listen to your teacher's instructions.

1.



2.



3.



4.



5.



6.



7.



8.





9.





10.





11.  





















12.  

13.  

14.  




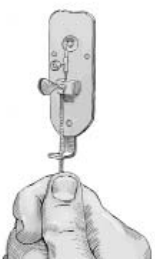







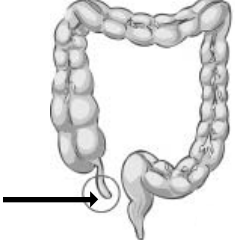






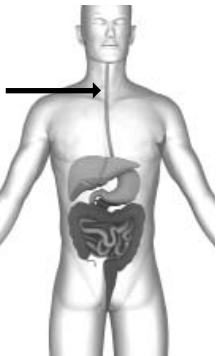

15.  















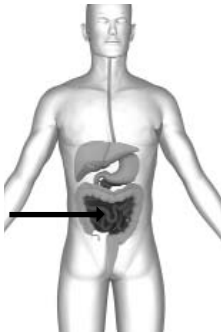
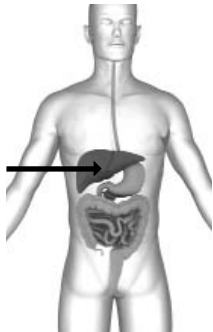




Directions: Listen to your teacher's instructions.

1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

11.	<input checked="" type="radio"/>	<input type="radio"/>
12.	<input checked="" type="radio"/>	<input type="radio"/>
13.	<input type="radio"/>	<input checked="" type="radio"/>
14.	<input type="radio"/>	<input checked="" type="radio"/>
15.	<input checked="" type="radio"/>	<input type="radio"/>




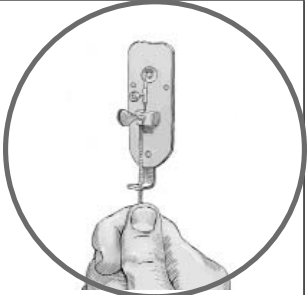
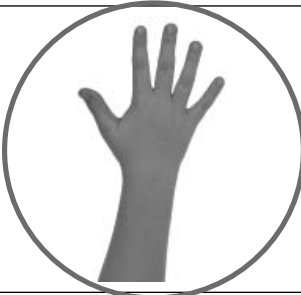


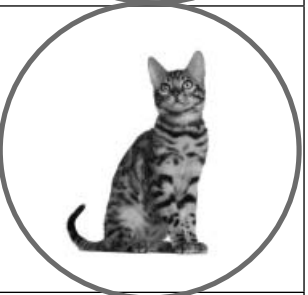



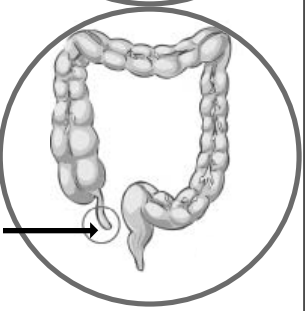






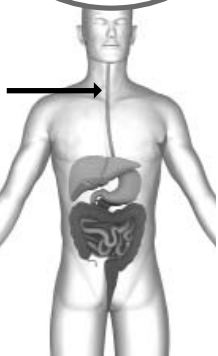

Directions: For each row of pictures you will be asked to look for specific things. Follow my directions carefully. In some instances there may be more than one right answer and you may circle more than one picture. We will do the first one together.

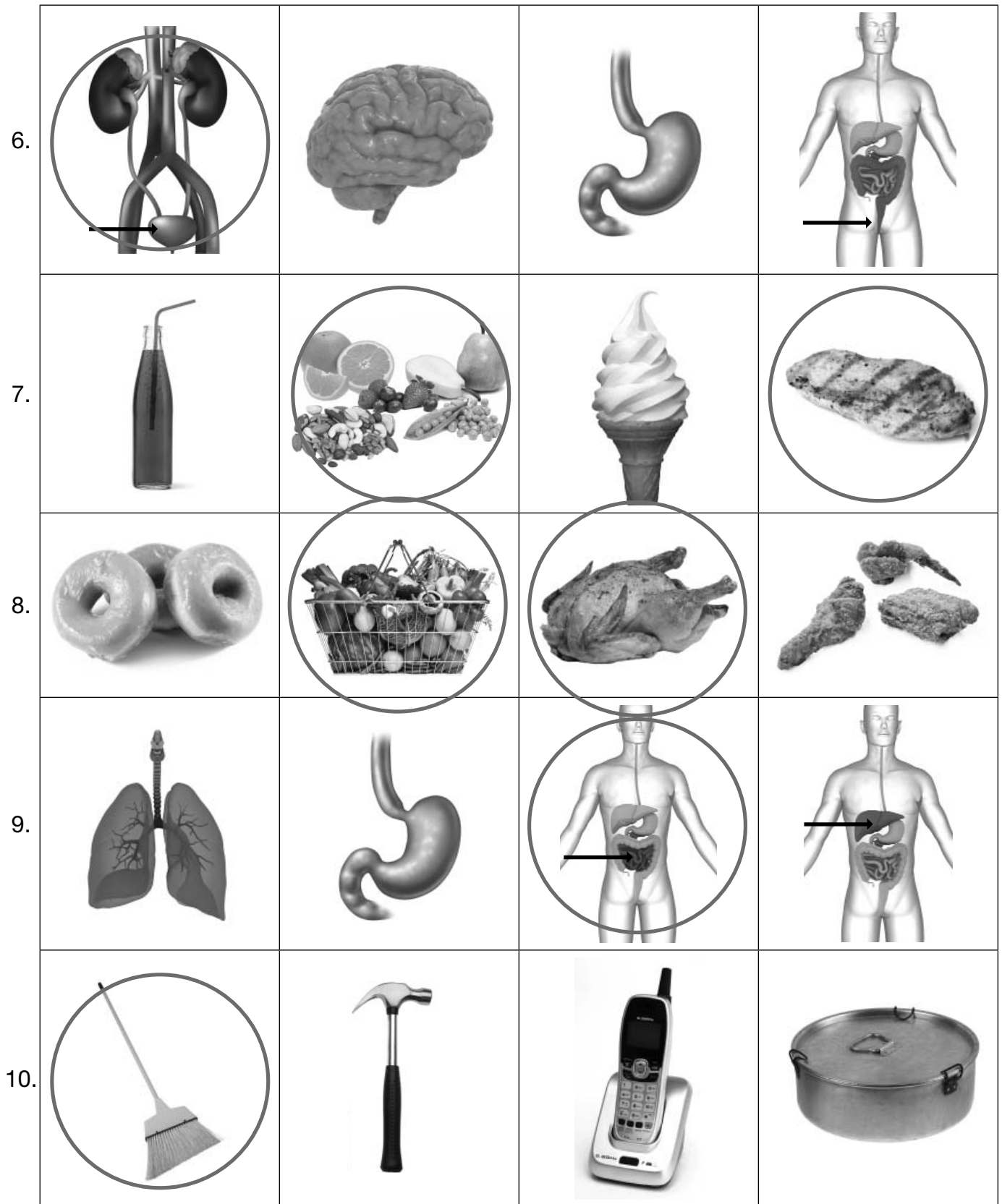
1.				
2.				
3.				
4.				
5.				

6.				
7.				
8.				
9.				
10.				



Directions: For each row of pictures you will be asked to look for specific things. Follow my directions carefully. In some instances there may be more than one right answer and you may circle more than one picture. We will do the first one together.

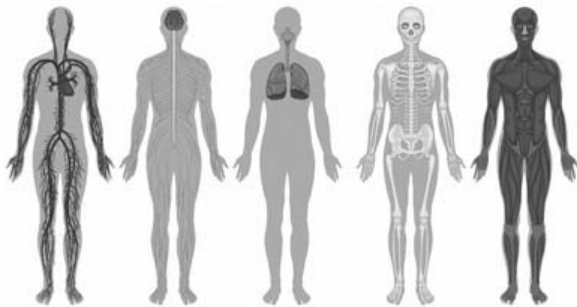
1.				
2.				
3.				
4.				
5.				



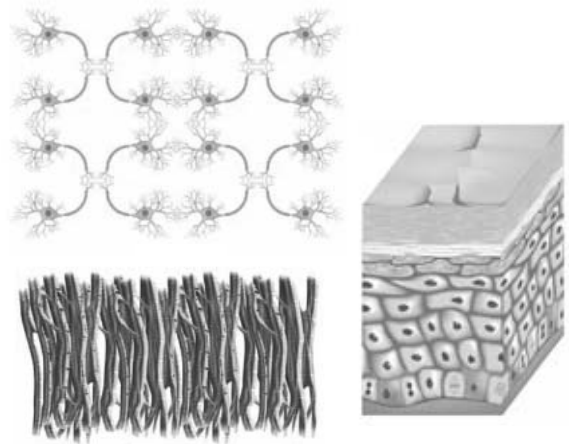
Name \_\_\_\_\_

cells	tissues
organs	systems

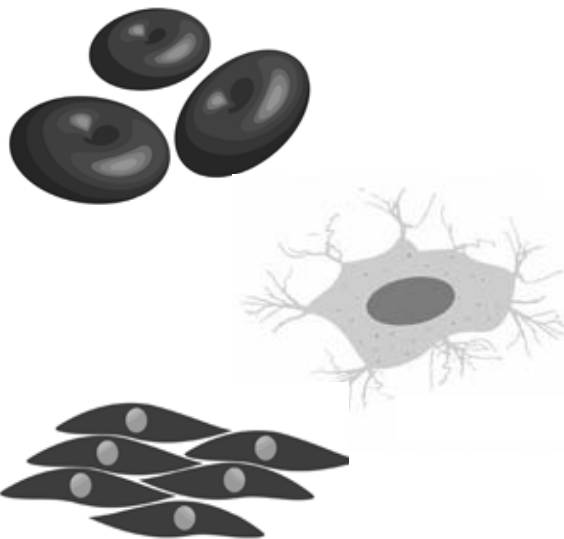
Directions: Choose the correct term from the word bank below that describes what the images are, and write the term in the blank provided.



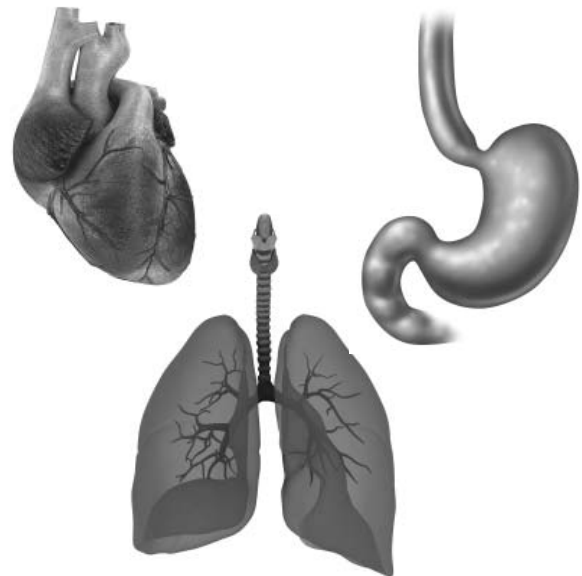
1. These are \_\_\_\_\_.



2. These are \_\_\_\_\_.



3. These are \_\_\_\_\_.

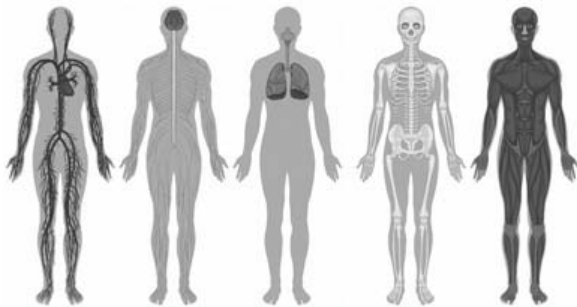


4. These are \_\_\_\_\_.

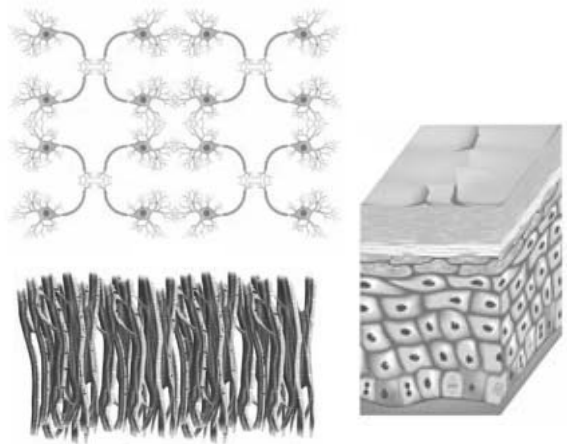


cells	tissues
organs	systems

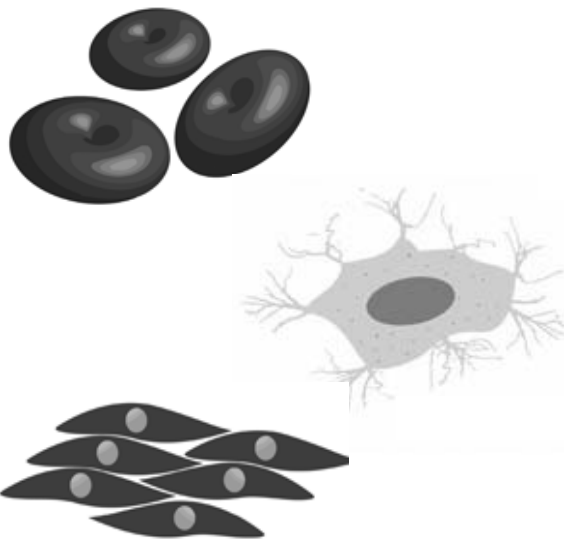
Directions: Choose the correct term from the word bank below that describes what the images are, and write the term in the blank provided.



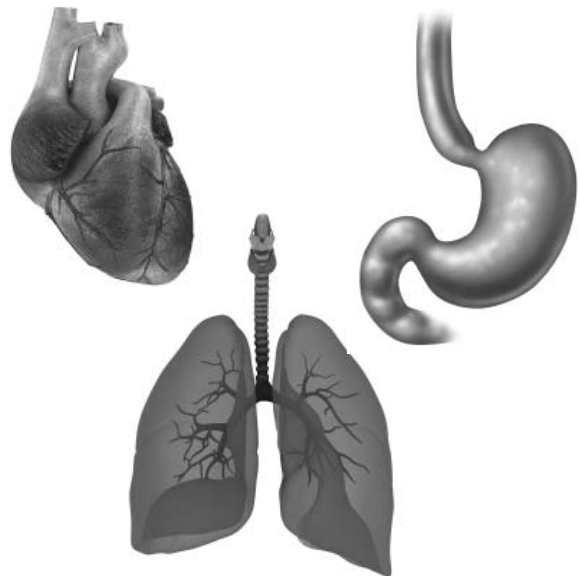
1. These are systems.



2. These are tissues.



3. These are cells.



4. These are organs.



Name \_\_\_\_\_

Directions: Listen to your teacher read each sentence. Think about the answer to the question. Write a few words, phrases, or sentences to answer each question or statement.

1. Explain what the digestive system does, and what some of the organs in the digestive system do.

---

---

---

---

---

---

2. Explain what the excretory system does, and what some of the organs in the excretory system do.

---

---

---

---

---

---

3. What should you eat to keep a well-balanced diet?

---

---

---

---

---

---

4. What are some things you can do to stay healthy?

---

---

---

---

---

---



# Tens Recording Chart

Use this grid to record Tens scores. Refer to the Tens Conversion Chart that follows.

[illegible]

# 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	
Number of Questions	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

## SERIES EDITOR-IN-CHIEF

E. D. Hirsch, Jr.

## PRESIDENT

Linda Bevilacqua

### EDITORIAL STAFF

Carolyn Gosse, Senior Editor - Preschool  
Khara Turnbull, Materials Development Manager  
Michelle L. Warner, Senior Editor - Listening & Learning

Mick Anderson  
Robin Blackshire  
Maggie Buchanan  
Paula Coyner  
Sue Fulton  
Sara Hunt  
Erin Kist  
Robin Luecke  
Rosie McCormick  
Cynthia Peng  
Liz Pettit  
Ellen Sadler  
Deborah Samley  
Diane Auger Smith  
Sarah Zelinke

### DESIGN AND GRAPHICS STAFF

Scott Ritchie, Creative Director

Kim Berrall  
Michael Donegan  
Liza Greene  
Matt Leech  
Bridget Moriarty  
Lauren Pack

### CONSULTING PROJECT MANAGEMENT SERVICES

ScribeConcepts.com

### ADDITIONAL CONSULTING SERVICES

Ang Blanchette  
Dorrit Green  
Carolyn Pinkerton

## ACKNOWLEDGMENTS

These materials are the result of the work, advice, and encouragement of numerous individuals over many years. Some of those singled out here already know the depth of our gratitude; others may be surprised to find themselves thanked publicly for help they gave quietly and generously for the sake of the enterprise alone. To helpers named and unnamed we are deeply grateful.

### CONTRIBUTORS TO EARLIER VERSIONS OF THESE MATERIALS

Susan B. Albaugh, Kazuko Ashizawa, Nancy Braier, Kathryn M. Cummings, Michelle De Groot, Diana Espinal, Mary E. Forbes, Michael L. Ford, Ted Hirsch, Danielle Knecht, James K. Lee, Diane Henry Leipzig, Martha G. Mack, Liana Mahoney, Isabel McLean, Steve Morrison, Juliane K. Munson, Elizabeth B. Rasmussen, Laura Tortorelli, Rachael L. Shaw, Sivan B. Sherman, Miriam E. Vidaver, Catherine S. Whittington, Jeannette A. Williams

We would like to extend special recognition to Program Directors Matthew Davis and Souzanne Wright who were instrumental to the early development of this program.

### SCHOOLS

We are truly grateful to the teachers, students, and administrators of the following schools for their willingness to field test these materials and for their invaluable advice: Capitol View Elementary, Challenge Foundation Academy (IN), Community Academy Public Charter School, Lake Lure Classical Academy, Lepanto Elementary School, New Holland Core Knowledge Academy, Paramount School of Excellence, Pioneer Challenge Foundation Academy, New York City PS 26R (The Carteret School), PS 30X (Wilton School), PS 50X (Clara Barton School), PS 96Q, PS 102X (Joseph O. Loretan), PS 104Q (The Bays Water), PS 214K (Michael Friedsam), PS 223Q (Lyndon B. Johnson School), PS 308K (Clara Cardwell), PS 333Q (Goldie Maple Academy), Sequoyah Elementary School, South Shore Charter Public School, Spartanburg Charter School, Steed Elementary School, Thomas Jefferson Classical Academy, Three Oaks Elementary, West Manor Elementary.

And a special thanks to the CKLA Pilot Coordinators Anita Henderson, Yasmin Lugo-Hernandez, and Susan Smith, whose suggestions and day-to-day support to teachers using these materials in their classrooms was critical.



## CREDITS

*Every effort has been taken to trace and acknowledge copyrights. The editors tender their apologies for any accidental infringement where copyright has proved untraceable. They would be pleased to insert the appropriate acknowledgment in any subsequent edition of this publication. Trademarks and trade names are shown in this publication for illustrative purposes only and are the property of their respective owners. The references to trademarks and trade names given herein do not affect their validity.*

*The Word Work exercises are based on the work of Beck, McKeown, and Kucan in Bringing Words to Life (The Guilford Press, 2002).*

*All photographs are used under license from Shutterstock, Inc. unless otherwise noted.*

### EXPERT REVIEWER

Kerry O. Cresawn

### WRITERS

Catherine S. Whittington

### ILLUSTRATORS

Marti Major

2A-7, 2A-11, 2A-12

Michael Parker

Cover (Nick Nutri), 1A-1,  
1A-13, 2A-1, 2A-13, 3A-1,  
3A-12, 4A-1, 4A-8, 4A-12,  
5A-1, 6A-1, 6A-4, 7A-1, 7A-10,  
7A-11, 8A-1, 8A-11, 9A-1,  
9A-6, 9A-10, 9A-12

### PHOTOGRAPHS

Chemical Heritage Foundation

2A-6

Library of Congress

3A-2





# **The Human Body: Building Blocks and Nutrition**

Tell It Again!™ Read-Aloud Anthology

Listening & Learning™ Strand  
**GRADE 2**

The Core Knowledge Foundation  
[www.coreknowledge.org](http://www.coreknowledge.org)