Sample Pages from

Teacher Created Materials

Created *by* Teachers *for* Teachers and Students

Thanks for checking us out. Please call us at **800-858-7339** with questions or feedback or to order this product. You can also order this product online at **www.tcmpub.com**.

For correlations to state standards, please visit
www.tcmpub.com/administrators/correlations

TIME for Kids Nonfiction Readers—Advanced Plus

This sample includes the following:

TIME FOR KIDS

Nonfiction Readers

Advanced Plus

Teacher's Guide

Teacher Created Materials

Table of Contents

Kit Components

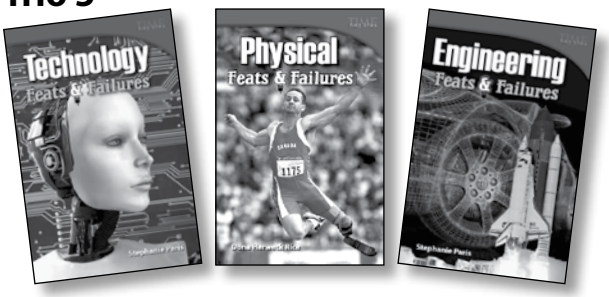
Trio 1

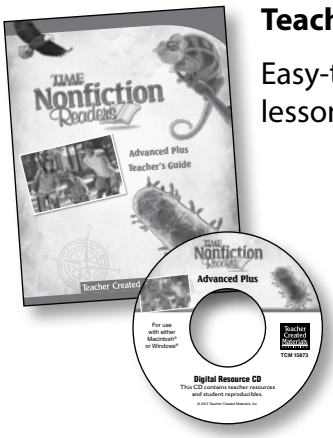
Trio 2

Trio 3

Trio 4

Trio 5





Teacher's Guide

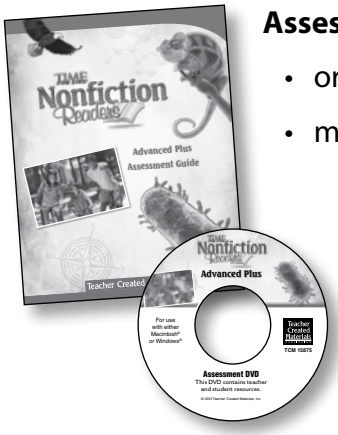
Easy-to-use, standards-based lesson plans

Digital Resource CD

- PDFs of books suitable for whiteboard use
- teacher resources
- student activity sheets

Audio CD

Professional recordings of books and poems

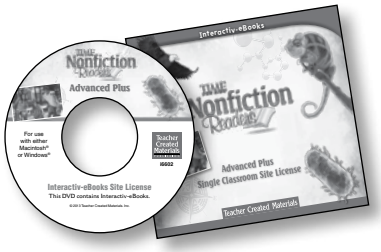


Assessment Guide

- oral reading records
- multiple-choice tests

Assessment DVD

- placement test
- assessments in both electronic and printable form

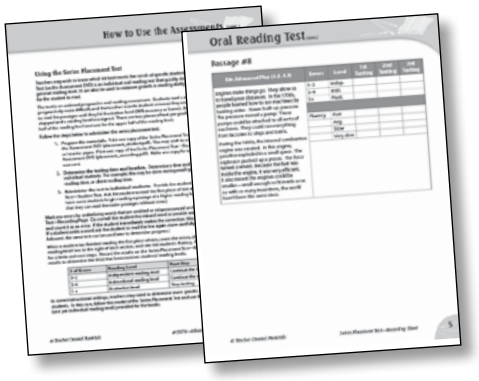


Interactiv-eBooks Single Classroom Site License

Interactiv-ebooks with embedded audio, videos, and activities

Getting Started

1. **Use the Series Placement Test.** Use the Series Placement Test (on the Assessment DVD) to determine which kit is most appropriate for students. For a complete overview of the placement test and directions for test administration, see page 7 of the Assessment Guide.



2. **Create reading groups.** If desired, place students in reading groups based on their reading levels or other instructional needs. See pages 29–30 for tips on using TIME For Kids *Nonfiction Readers* in a guided reading/ balanced literacy model.

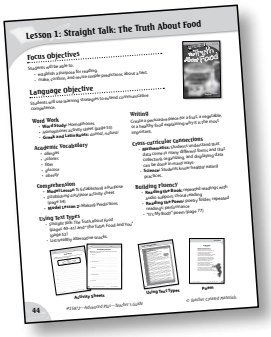
3. **Prepare student resources.** As an option, create some student resources, including a personal dictionary and a poetry folder. These can be created with common classroom resources such as lined paper, construction paper, and spiral notebooks. See pages 226–228 (or the Digital Resource CD) for cover templates for these resources.

4. **Prepare assessment resources.** Depending on the amount of regular assessment planned, you may wish to create a simple assessment folder for each student. These folders can hold the student's placement test, oral reading records, multiple-choice tests, activity pages, and anecdotal records taken during the reading lessons.

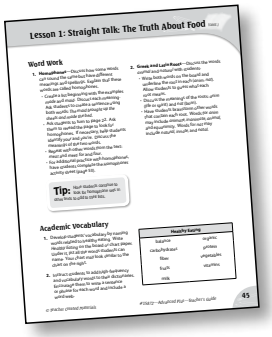
5. **Make a home-school connection.** Send the Parent Tips booklet (found on the Digital Resource CD) home with students. The tips and activities in the booklet provide family members with the necessary tools to promote literacy development at home.

Teaching a Lesson

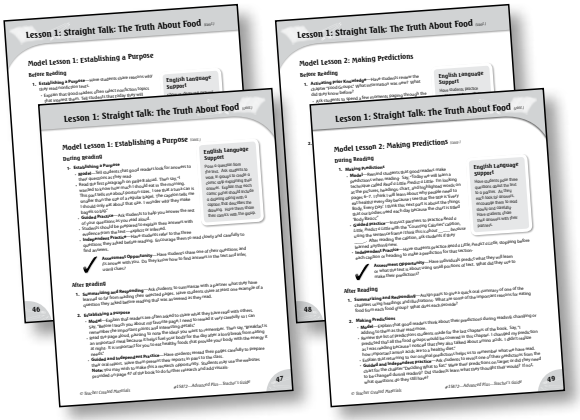
Each 11-page lesson is organized in a consistent format for ease of use. Teachers may choose to complete some or all of the lesson activities in order to best meet the needs of their students. The lesson begins with an overview page that provides key information for planning purposes.



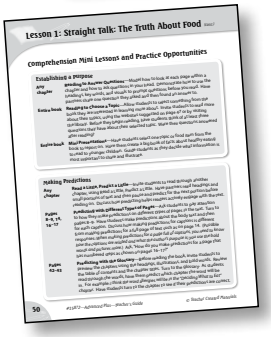
Lesson overview provides lesson objectives and key information for planning purposes.



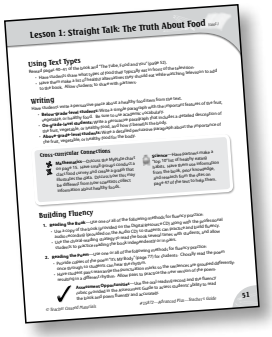
Word Work and Academic Vocabulary sections include activities and suggestions for teaching word patterns, parts of speech, Greek and Latin Roots, and key academic vocabulary.



Two Comprehension Model Lessons are carefully scaffolded and provide teacher modeling through think alouds as well as guided and independent practice opportunities for before, during, and after reading.

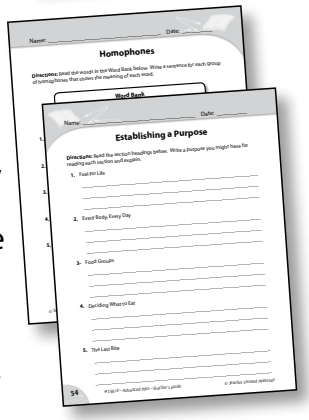


Comprehension Mini Lessons and Practice Opportunities provide teachers with simple and engaging activities that reinforce the comprehension skill addressed in the lesson.



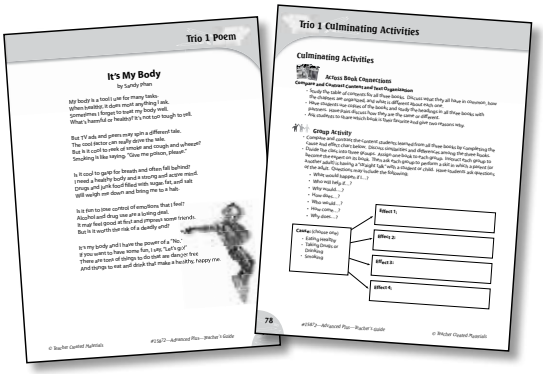
Using Text Types, Writing, Cross-curricular Connections, and Building Fluency sections offer additional activities for building comprehension and making connections.

Each lesson includes an **additional content-related text piece** (step-by-step instructions, primary sources, advertisements, magazine articles, etc.) to support comprehension. This text piece is used with the Using Text Type section of the lesson.



Student activity sheets can be used in a variety of ways to meet student's needs. They offer additional opportunities for practicing the skills addressed in the lesson.

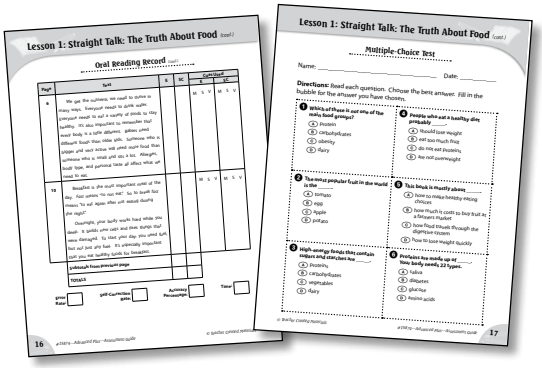
Using the Trio Resources



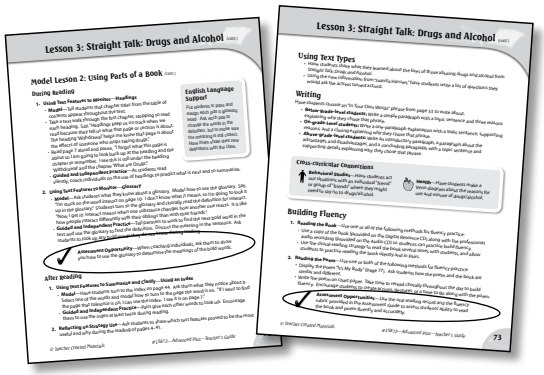
The fluency poem provided at the end of each trio provides a thematic connection to the book and can be used as a tool for building both content-area vocabulary and fluency. The Culminating Activities provide students with the opportunity to make across book connections and can be used as a tool for small-group interaction and for building comprehension.

Using Assessment Options

1. **Use formal assessments at the end of each lesson.** The oral reading record and multiple-choice comprehension test provided for each book offer opportunities to assess student learning and can be used to drive instruction. An overview of these assessments and the assessments themselves can be found in the Assessment Guide. The accompanying Assessment DVD offers two versions of the multiple-choice assessments: printable PDF form and electronic form, giving students the opportunity to take the test on the computer and print their results.



2. **Use informal assessments during each lesson.** Refer to the assessment tips embedded throughout the lessons to gather information about students' reading skills. Record anecdotal records as they meet the needs of your classroom.



Using Technology Options

1. **Use the Audio CD as a model of fluent reading.** The Audio CD includes professional recordings of the books and poems in this kit. Play the audio tracks of the books to support students as a prereading activity, during fluency practice, or in a listening center. Play the audio tracks of the poems as part of the poetry section of the lesson.

2. **Use the Interactiv-eBooks to enhance the reading experience.** This kit includes interactiv-ebooks that guide students toward independent reading and engage them in a fully interactive experience. Students can hear the text read aloud, view video clips, record their voices, and complete interactive activities that build academic skills—from word study and vocabulary to comprehension and writing. The interactiv-ebooks can be used in a variety of instructional settings and help support numerous literacy and learning goals. For a detailed overview of how to use the interactiv-ebooks in the classroom, see pages 40–41.

About the Books

TIME For Kids *Nonfiction Readers* is designed to enhance any reading program. Each book motivates students to *want* to read with high-interest content and engaging photographs. The authentic reading experiences help students develop vocabulary, comprehension, and fluency skills.

The books are grouped by reading levels. Advanced readers (levels 4.5 through 4.9) are designed for students in the second semester of grade four.

Level 4.5: *Straight Talk: The Truth About Food; Straight Talk: Smoking; Straight Talk: Drugs and Alcohol*

Level 4.6: *Strange but True: Gross Anatomy; Strange but True: Bizarre Animals; Strange but True: Tiny Creatures*

Level 4.7: *Helen Keller: A New Vision; Nelson Mandela: Leading the Way; Anne Frank: A Light in the Dark*

Level 4.8: *Hand to Heart: Improving Communities; Hand to Paw: Protecting Animals; Hand to Earth: Saving the Environment*

Level 4.9: *Technology Feats and Failures; Physical Feats and Failures; Engineering Feats and Failures;*

Leveling Components

Each reading level offers a variety of specialized features, including the following:

- introduction to more sophisticated fonts in sidebars and chapter headings
- text features, such as a bibliography to extend reading, "More to Explore" to extend and support the content, a glossary, an index, and a table of contents
- interactive spreads to prompt critical thinking
- increased use of diverse illustration, graphics and text features
- 48 pages for a robust reading experience
- a reduced trim size of 5.25 x 8 inches

Special Features in the Books

Each reader includes the following special features to enhance the reading experience:

Think Link

- Introduces main concepts.
- Poses three critical thinking questions or key points to encourage reading with a purpose.

Dig Deeper

- Provides background knowledge to access a deeper understanding.
- Offers a variety of text types, including instructions, maps, diagrams, and interviews.
- Provides high-interest graphics and interaction.

Stop! Think

- Poses additional critical thinking questions.
- Guides students in expanding their visual literacy and comprehension, using information from charts, graphs, and more.

Word Counts and Level Correlations

Advanced Plus Title	Word Count	TCM Level	Guided Reading Level	Early Intervention Level	DRA Level	Lexile® Measure
Straight Talk: The Truth About Food	1651	4.5	R	25	40	740L
Straight Talk: Smoking	1537	4.5	R	25	40	700L
Straight Talk: Drugs and Alcohol	1505	4.5	R	25	40	730L
Strange but True: Gross Anatomy	1519	4.6	R	25	40	740L
Strange but True: Bizarre Animals	1543	4.6	R	25	40	730L
Strange but True: Tiny Creatures	1501	4.6	R	25	40	730L
Helen Keller: A New Vision	1607	4.7	S	26	44	690L
Nelson Mandela: Leading the Way	1555	4.7	S	26	44	640L
Anne Frank: A Light in the Dark	1678	4.7	S	26	44	720L
Hand to Heart: Improving Communities	1574	4.8	S	26	44	680L
Hand to Paw: Protecting Animals	1617	4.8	S	26	44	640L
Hand to Earth: Saving the Environment	1534	4.8	S	26	44	680L
Technology Feats and Failures	1568	4.9	S	26	44	660L
Physical Feats and Failures	1672	4.9	S	26	44	800L
Engineering Feats and Failures	1525	4.9	S	26	44	670L

Using TIME For Kids *Nonfiction Readers* in a Guided Reading/ Balanced Literacy Model

TIME For Kids *Nonfiction Readers* is a supplemental leveled reading program that can be flexibly implemented in a guided reading/ balanced literacy model. The high-interest books provide an engaging reading experience, while supporting the development of important reading skills including comprehension, fluency, vocabulary, and word work. The comprehensive Teacher's Guide with step-by-step, scaffolded model lessons and student activities can be easily incorporated into any block of a balanced literacy model including large group, guided reading groups, literature circles, or independent work time. Multiple assessment opportunities will diagnose students' needs and help direct teachers as they plan for differentiation and inform their instruction as they move students toward mastery of key reading and writing skills.

Guided Reading

Two key features of TIME For Kids *Nonfiction Readers* allow it to be effectively used within a guided reading program. First, it can serve to target specific word-work skills. Second, the high-interest leveled books make them ideal selections for use with groups who need practice at certain reading levels and with general reading skills.

The Time For Kids *Nonfiction Readers* are ideal to use with small teacher-led guided reading groups. The high-interest leveled books in this kit make them ideal selections to use with readers who read at levels 4.5–4.9. Oral reading records for each book are included in the Assessment Guide (and in digital format on the Assessment DVD) so that teachers can monitor the progress of students as they increase their reading level. The chart on page 28 indicates the reading levels of the books included within this kit.

The easy-to-follow lesson plan offers a carefully scaffolded format that provides explicit teacher modeling through think alouds as well as guided practice to use with peers and independently (Oczkus 2009). Teachers may use the Time For Kids *Nonfiction Readers* in a variety of small group settings including guided reading groups and as an intervention with struggling readers.

Additionally, the strong word work and rich language support make Time For Kids *Nonfiction Readers* an excellent program to use with English Language Learners.

Lesson Plan Structure

The core of the guided reading lesson is organized around Before, During, and After Reading activities and suggestions. Each book targets two main strategies or skills (refer to page 229 for a complete list of the skills addressed in this kit). Each comprehension strategy lesson is carefully scaffolded using teacher modeling, guided practice, and independent practice. The lessons are designed to provide a rich menu for teachers to pick and choose from as they differentiate instruction for students. If needed, the lessons can also be used as a quick review or mini-lesson.

Targeting Leveled Practice and Other Reading Skills

Each book included in the TIME For Kids *Nonfiction Readers* program has been leveled for use in small groups of students with similar reading levels. In addition to teaching the specific comprehension skills students need to read nonfiction, the lesson plans for the Time For Kids *Nonfiction Readers* also include carefully crafted instruction in the following areas of literacy:

Word Work: Students study word patterns, parts of speech, and Greek and Latin roots.

Guided Reading (cont.)

Academic Vocabulary: Students study key academic vocabulary through the use of dictionaries, graphic organizers, drama, sketching, and glossary use. Many of the activities are appropriate for whole-class work in a vocabulary session focusing on activities suggested in the lesson plans for vocabulary development or for word-knowledge practice.

Fluency: Fluency lessons are based on reading the book, a poem, or other content-related text.

Writing: The lesson plan for each book includes a writing activity. Additionally, writing is integrated into the activity sheets. Depending on the level of the TIME For Kids *Nonfiction Readers* kit a teacher is using in the classroom, the writing activities vary from requiring students to write sentences to writing short stories as a way to apply the new skills they learn, or as a way to show comprehension of the story.

In addition to nonfiction reading skill development, as students move through the books in the program they will encounter carefully written content designed to provide practice with many other areas of literacy, such as word knowledge and increasingly complex sentence structures and text features.

Progress Monitoring

Assessment options are found directly in the lesson so that teachers can keep ongoing formative assessment records and adjust instruction accordingly. Oral reading records and comprehension checks are included to help provide further opportunities to monitor student progress. During the lessons frequent assessment checks and suggestions for observing students while reading offer concrete ways to inform instruction and chart student progress in the program. The activity sheets that accompany each lesson also provide assessment checks for the teacher. The informal and formal assessments are in easy-to-use formats.

Other Blocks of a Balanced Reading Program

Learning Centers and Independent Practice

One of the challenges of a guided reading program is making sure the students who are not in the small instructional group with which the teacher is currently working are constructively engaged. TIME For Kids *Nonfiction Readers* lesson plans provide ample suggestions and materials for independent student use and for the development of centers. For example, two high-interest activity sheets are included for each book. Students may complete these practice pages independently after reading the book.

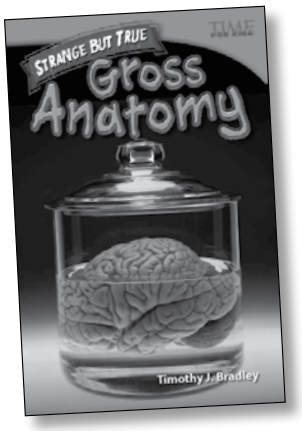
Independent Reading

Students who spend more time reading independently outperform their peers on standardized tests and other measures. Time spent reading independently is the best predictor of reading achievement (Anderson, Wilson, & Fielding 1988). The books from the Time For Kids *Nonfiction Readers* series provide easy-to-read and high-interest content. They can be added to classroom libraries for independent reading selections.

Using Text Types

Intertextuality is the way that one text might draw on or resemble the characteristics of another, causing the reader of the texts to make links between them (Anstey and Bull 2006, 30). Students need to be able to integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. They also need to be able to analyze how two or more texts address similar themes or topics to build knowledge or to compare the approaches the authors take (National Governors Association Center for Best Practices and Council of Chief State School Officers 2010). Each book in this kit has an additional content-related text selection to support this key skill.

Lesson 4: Strange but True: Gross Anatomy



Focus Objectives

Students will be able to:

- use mental images based on pictures and print to aid in comprehension.
- summarize and paraphrase information in text.

Language Objective

Students will use appropriate learning strategies to construct and apply academic knowledge.

Word Work

- **Word Study:** Shades of Meaning
- **Greek and Latin Root:** *microscope*, *dissect*

Academic Vocabulary

- *cadavers*
- *dissect*
- *ligaments*
- *organs*
- *stimuli*
- *Gross Anatomy Words* activity sheet (page 88)

Comprehension

- **Model Lesson 1:** Using Mental Images
- **Model Lesson 2:** Summarizing and Paraphrasing
- *Thinking About Gross Anatomy* activity sheet (page 89)

Using Text Types

- *Strange but True: Gross Anatomy* and "FDA Approves Leeches..." (page 87)
- Compare and contrast using a Venn diagram.

Writing

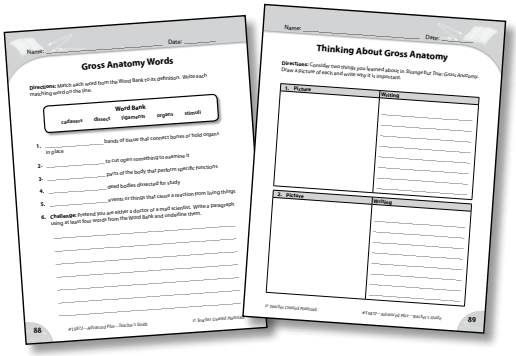
Write an "autobiography" for an organ.

Cross-curricular Connections

- **Health**—Understands the influence of rest, food choices, exercise, sleep, and recreation on a person's well-being.
- **Science**—Knows different ways in which living things can be grouped (e.g., plants/animals, bones/no bones, insects/spiders, live on land/live in water) and purposes of different groupings.

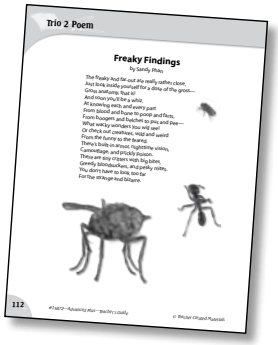
Building Fluency

- **Reading the Book:** repeated readings with audio support; choral reading
- **Reading the Poem:** poetry folder; repeated readings; performance
- "Freaky Findings" poem (page 112)



Activity Sheets

Using Text Types



Poem

Word Work

1. **Shades of Meaning**—Review synonyms and antonyms.
   - Write the sentence, *The human body has built giant cities* on the board and underline the word *giant*. As a group, brainstorm synonyms for *giant*.
   - Discuss how synonyms often don't have exactly the same meaning, but the word can reveal more descriptive detail.
   - Create a three-column chart. Label columns from left to right: *Less, Original Word,* and *More*. In the second column, write the word *giant* and then sort the other words that you came up with.
   - Discuss other words from the text and the shades of meaning of their synonyms such as *long*, *study*, *destroy*, *great*, and *high*.

Tip: Design questions around personal interests. For example, ask, "Would you rather get a *giant* amount of homework or a *large* amount?"

2. **Greek and Latin Roots**—Discuss the words *microscope* and *dissect* with students.
   - Write both words on the board and underline the prefix in each (*micro-*, *dis-*). Allow students to guess what each one means.
   - Discuss the meanings of the prefixes: *micro-* (very small) and *dis-* (away, apart). Brainstorm a list of words that contain either of the prefixes (*microbe, microchip, microgram, disappear, disarm, disagree, discourage*).
   - Have students work in groups to look up the definitions for each word. Discuss the definitions together as a class.

Academic Vocabulary

1. Develop students' vocabulary by looking at the pair of vocabulary words: *cadaver* and *dissect*. Have them use a dictionary to find the definition for each word. Then have students write a sentence using both words. As time permits, repeat this process for the remaining academic vocabulary words listed on page 79.

2. Instruct students to add these vocabulary words to their dictionaries. Encourage them to write a sentence for each word.

3. For additional practice with academic vocabulary, have students complete the *Thinking About Gross Anatomy* activity sheet (page 89).

Model Lesson 1: Using Mental Images

Before Reading

1. **Activating Prior Knowledge and Making Connections**—Ask students to preview the cover and discuss with partners what they already know about anatomy. Look over the table of contents and give students time to scan the pages of the book while they think about what they know about anatomy.

2. **Using Mental Images**
   - **Model**—Share a few of your favorite photos from the book. Say, "Authors use words to provide us with pictures of their ideas. We can use those words and use our 'mind camera' to make pictures in our heads. Page 18 has a great photo of a person snorkeling. In the text, the author wrote, 'Swimmers practice holding their breath so they can stay underwater longer.' In my mind camera, I can picture a swimmer underwater." Copy the sentence onto a chart, underlining *holding their breath, underwater*, and *longer* telling students that these words helped you to make a picture in your head. The photo of the swimmer helped as well.
   - **Guided Practice**—Read aloud the beginning of the "Respiration and Circulation" section on page 18.
   - Ask students to close their eyes and "see" what the author is writing. Together, read the next few sentences about breathing. Reread the second paragraph, pausing after each sentence to sketch on a chart the following:
     - *oxygen enters nose and mouth*
     - *oxygen flows into lungs and passes into blood*
     - *carbon dioxide leaves the body*
   - Distribute small papers or index cards and ask students to sketch the rest of the section. Continue reading aloud, pausing so students can draw what they see in their mind cameras. Ask students to identify which specific words helped them the most when imagining their pictures. Tell students that using our mind cameras when we read is not only fun but it helps us to learn and remember more. Tell students to be on the lookout for sentences that help them use their mind cameras.

English Language Support

Make a chart with a column for each of the physical activities mentioned in the text. Discuss each of the body-specific vocabulary words and have students place the words in the best column. Have students sketch pictures for each of the words and describe their pictures orally.

Model Lesson 1: Using Mental Images *(cont.)*

During Reading

1. **Using Mental Images**
   - **Model**—Tell students that paying close attention when reading helps us make strong pictures in our minds. For example, say, "When reading page 19 about coughing, the sentences 'Thousands of small saliva droplets fly in a single cough. Some of those droplets can fly at up to 60 miles per hour!' I can imagine what this looks like because I've coughed and also been near a person coughing before. Have you? With my mind camera, I can visualize little spit droplets flying out of someone's mouth. Yuck!"
   - **Guided and Independent Practice**—Give students a paper folded in half and ask them to find two sentences in the text that helped them make a strong picture in their minds.
   - Have students copy each sentence and underline the two key words that helped them use their mind camera.
   - Have them sketch pictures to go with each sentence.

English Language Support

Have students work with partners to make lists of words that interest them from the text. Model how to use a dictionary to find the meanings of words. Have students use a dictionary to find the meaning of each of the words from their list.

Assessment Opportunity—When students are reading, ask them to identify words that elicit strong visual images.

After Reading

1. **Using Mental Images**
   - **Model**—Share your favorite sentence from the book for making a picture in your mind.
   - Explain why you like the sentence and what words help you the most in making a picture in your head. For example, say, "On page 32, it reads, 'Taste buds are arranged in patches on the top of the tongue.' I was able to get a clear picture of a tongue and the tiny ball-like things that are all over it."
   - **Guided Practice**—Tell students to find one sentence they think makes a strong mind picture and identify which two or three words help them see the picture in their minds. Allow time for students to share their findings with partners.

Model Lesson 2: Summarizing and Paraphrasing

Before Reading

1. **Activating Prior Knowledge**—Ask students if they have ever seen a skeleton or a model of the human body with muscles and organs. Discuss what these models look like and how they represent the body. How might this knowledge help them interpret the text?

2. **Summarizing and Paraphrasing**
   - **Model**—Read page 4 together. After reading, say, "Now that I have read carefully, I'm going to pause and reword what the author has just told me."
   - Say, "The human body is more than what it seems from the outside. There are many gross and amazing things about our bodies even though they seem boring from the outside. Do you think that is what the author was trying to say? Would you word it differently? Do you think what I said has the same message as the author's? Why is it important not to change the message?"
   - **Guided Practice**—Explain that paraphrasing is rewording a part of or all of a text, stating its meaning in another way. It is putting the author's ideas into your own words.
   - Ask students how putting the author's ideas into their own words can help them become better readers. Say, "Putting the author's ideas in my own words, or paraphrasing, can help me better understand and remember what I read."

English Language Support

Look at the table of contents together. Read aloud the chapter headings and have students repeat them after you. Discuss each title and what information they might find in each chapter. Have students make "*I predict _____ because _____*" statements about what they think each chapter will cover.

Model Lesson 2: Summarizing and Paraphrasing *(cont.)*

During Reading

1. **Summarizing and Paraphrasing**
   - **Model**—Tell students that unlike a summary, a paraphrase is not necessarily shorter than the author's original message. It is just putting the message in your own words. Explain that in order to paraphrase, a reader must first understand the author's message.
   - Read page 6 aloud. Say, "Now that I have read page 6, I am going to think about the author's message. The author was writing about bones and muscles. So that is what my paraphrasing is going to focus on. Here is a sample of how I might paraphrase the author's message: Our bones and muscles are very important. They give our body its shape and protect our organs. We couldn't live without them."
   - **Guided and Independent Practice**—Tell students that reading for understanding and being aware of the author's message is the first step to paraphrasing.
   - Invite students to work in pairs to read a section of the text and paraphrase the author's message in their own words. After allowing students time to read and paraphrase say, "How were your paraphrases the same and different from each other? Was the message the same or slightly different? Is that okay for a paraphrase?"

English Language Support

Have students complete Venn diagrams comparing and contrasting bones and muscles. Have them explain how they are similar and how they are different.

Assessment Opportunity—While students read independently, ask each student to whisper read to you. Then pause and ask them to paraphrase what he or she just read.

After Reading

1. **Paraphrasing**—Ask students to share their favorite parts of the text. As a group, paraphrase the author's message for each of their favorite parts.
   - Ask students to think back to the paraphrasing they did during reading. How did it help them understand and remember the author's message? Allow time for all students to share.
   - Explain that paraphrasing the text helps us check our understanding of the text and it is often easier to remember our own words than those of the author(s). Say, "Thinking about what we have read and how we would say it helps us be good readers."
   - For additional practice with comprehension, have students complete the *Thinking About Gross Anatomy* activity sheet (page 89).

Comprehension Mini Lessons and Practice Opportunities

Using Mental Images

Pages 24–27	**Imagining Practice**—Ask students to think about what they already know about the body. Reread pages 24–27 and ask them to make pictures in their heads about what happens during digestion.
Entire book	**Using Sensory Images During Reading**—Find examples in the text where the reader needs to use sensory details to fully understand the text. Ask students to sketch or act out each one.
Pages 42–43	**Glossary Sense Walk**—Have students turn to the glossary and read the list of words with partners. What images, sights, sounds, and smells come to mind? Have students choose their top five favorite words and sketch illustrations to go with them.

Summarizing and Paraphrasing

Pages 42–43	**Using the Glossary to Paraphrase**—Have students study the glossary and write the words on sticky notes. Instruct them to group the words according to which heading they belong with. Have students then use the glossary words to help paraphrase what they have learned.
Pages 44–45	**Index Hunt**—Have students select 10 words from the index and write them on sticky notes. Tell them to mark each word with a "+" for main ideas, a "–" for key details, and a "*" for interesting facts. This may be done with partners or in small groups.
Entire book	**Which Heading Is It?**—Have students select a heading and paraphrase the author's message without telling the class which heading it is. Have the rest of the class look through the book and name the heading they think their partner is paraphrasing.

Using Text Types

Reread "Blood Bath" on page 20 of *Strange but True: Gross Anatomy* and "FDA Approves Leeches..." (page 87).

- Have students share what they notice about each piece of text.
- As a class, use a Venn diagram to compare and contrast the information about leeches found in both pieces of text.

Writing

Have students write an autobiography of an organ and its function.

- **Below-grade-level students:** Write about what the organ does.
- **On-grade-level students:** Write about what the organ does and why it is important.
- **Above-grade-level students:** Write about what the organ does, why it is important, and how it works with other body parts.

Cross-curricular Connections

Health—Divide the class into five groups. Assign each group either rest, food choices, exercise, sleep, or recreation. Have each group research the effects their assigned task has on a person's well-being.

Science—Discuss animal classifications in relation to their body structures such as bones and muscles. Make sure to discuss the internal skeleton of fish, amphibians, birds, and mammals.

Building Fluency

1. **Reading the Book**—Use one or all of the following methods for fluency practice:
   - Use a copy of the book (provided on the Digital Resource CD) along with the professional audio recording (provided on the Audio CD) so students can practice building fluency.
   - Use the choral-reading strategy to read the book several times with students and allow students to practice reading the book silently and in pairs.
2. **Reading the Poem**—Use one or all of the following methods for fluency practice:
   - Display the poem "Freaky Findings" (page 112). To model proper fluency, allow students to listen to the professional recording of the poem (provided on the Audio CD).
   - Put students into groups of three. Assign each group a section of the poem. Have them create one movement to make while reading the poem to go along with the rhythm, such as clapping their hands or stomping their feet.

Assessment Opportunities—Use the oral reading record and the fluency rubric provided in the Assessment Guide to assess students' ability to read the book and poem fluently and accurately.

FDA approves leeches as medical devices

French firm to market bloodsucking creatures in U.S.

The government has lent its seal of approval to marketing an age-old medical device—leeches.

The Food and Drug Administration said Monday that Ricarimpex SAS, a French firm, is the first company to request and receive FDA clearance to market the bloodsucking aquatic animals as medical devices.

Leeches are already widely used in American hospitals, and companies that raised and sold them here before 1976 were allowed to continue doing so. However, the medical device law passed that year required newcomers to the field to seek approval.

For many people, leeches conjure up the image of Humphrey Bogart removing the bloodsuckers from his legs in African Queen, but FDA reports that leeches can help heal skin grafts by removing blood pooled under the graft and restore blood circulation in blocked veins by removing pooled blood.

Indeed the use of leeches to draw blood goes back thousands of years. They were widely used as an alternative treatment to bloodletting and amputation for several thousand years. Leeches reached their height of medicinal use in the mid-1800s.

FDA noted that today they are used in medicine throughout the world as tools in skin grafts and reattachment surgery.

Medicinal leeches—Hirudo medicinalis—normally make their home in fresh water.

In considering the Ricarimpex application, the FDA said it analyzed the use of leeches in medicine, evaluated safety data provided by the firm and studied how the leeches are fed, their environment and the personnel who handle them.

http://www.msnbc.msn.com/id/5319129/ns/health-health_care/t/fda-approves-leeches-medical-devices/#.T_yaviO-2x4

Name: _____ Date: _____

Gross Anatomy Words

Directions: Match each word from the Word Bank to its definition. Write each matching word on the line.

Word Bank

cadavers **dissect** **ligaments** **organs** **stimuli**

1. _____ bands of tissue that connect bones or hold organs in place
2. _____ to cut open something to examine it
3. _____ parts of the body that perform specific functions
4. _____ dead bodies dissected for study
5. _____ events or things that cause a reaction from living things
6. **Challenge:** Pretend you are either a doctor or a mad scientist. Write a paragraph using at least four words from the Word Bank and underline them.

_____

_____

_____

_____

_____

_____

_____

Name: _____ Date: _____

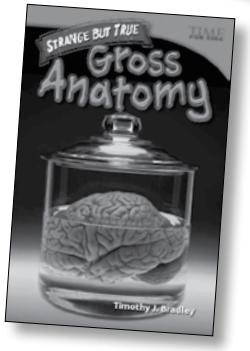
Thinking About Gross Anatomy

Directions: Consider two things you learned about in *Strange but True: Gross Anatomy*. Draw a picture of each and write why it is important.

1. Picture	Writing
	_____ _____ _____ _____ _____ _____ _____ _____

2. Picture	Writing
	_____ _____ _____ _____ _____ _____ _____ _____

Oral Reading Record



Name:_____ **Date:** _____

Assessor: _____

Word Count	Codes				
258	E = errors	SC = self-corrections	M = meaning	S = structure	V = visual

Page	Text	E	SC	Cues Used	
				E	SC
4	There's a lot more than just blood and guts inside the human body. There's gas, earwax, vomit, scabs, pus, boogers, and belches, too! From head to toe, our bodies are amazing—and gross! Around 2,000 years ago, scientists began to peek inside. They began to dissect human bodies. From the outside, we may look pretty boring. But cut us open, and inside you'll find a world stranger than any planet.			M S V	M S V
6	What would happen if your bones and muscles suddenly disappeared? You would flop to the ground, unable to move or function. You would be a puddle of skin, blood, and guts. The only good news is you wouldn't be able to live very long in this state.			M S V	M S V
	SUBTOTALS				

GO ON

Oral Reading Record *(cont.)*

Page	Text	E	SC	Cues Used	
				E	SC
8	No bones about it. Our skeletons hold us together. When you think of bones, you may picture the dry, hard bones you see in a museum. But our bones are alive. They grow and change just like the rest of the body. If a bone is broken, the body is able to repair it. New bone joins the broken ends, and the repaired bone may be as strong as it was before. Bone is made of calcium and other elements. Calcium is very strong. Ligaments and tendons hold the bones together. Joints are formed where the bones meet. The elbow is one of the most used joints in the body. To keep the bones from rubbing against each other, pads of cartilage cushion the joints. Throughout the day, cartilage shrinks. That's why we're taller in the morning and shorter at night!			M S V	M S V
	Subtotals from previous page				
	TOTALS				

Error Rate: ☐ **Self-Correction Rate:** ☐ **Accuracy Percentage:** ☐ **Time:** ☐

Multiple-Choice Test

Name: _____ Date: _____

Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen.

1 **Which of these is *not* part of the digestive system?**

- (A) stomach
- (B) large intestine
- (C) lungs
- (D) small intestine

2 **The _____ is the largest organ of the body.**

- (A) skin
- (B) heart
- (C) brain
- (D) stomach

3 **If Tracy eats blueberries and Bryan eats broccoli, which one will digest the food first?**

- (A) Neither will digest the food.
- (B) They will digest the food at the same time.
- (C) Tracy
- (D) Bryan

4 **Cells that transmit messages to the brain are called _____.**

- (A) ligaments
- (B) nerves
- (C) stimuli
- (D) tendons

5 **When you have a cold, your nose feels stuffed up. What can you infer from that?**

- (A) You cannot taste things as well.
- (B) You cannot open your mouth.
- (C) Your blood stops circulating.
- (D) Your stomach stops working.

6 **The heart is made up of _____.**

- (A) bones
- (B) smooth muscle
- (C) skeletal muscle
- (D) cardiac muscle

Multiple-Choice Test *(cont.)*

Name: _____ Date: _____

7 **Moving your body helps you know why _____ is important.**

- (A) your sense of sight
- (B) the muscular system
- (C) sleep
- (D) your stomach

8 **Which of the following is *not* true about bones?**

- (A) They support the organs.
- (B) They protect the brain.
- (C) They shrink throughout the day.
- (D) They grow and change.

9 **Which is the first thing that happens when you digest food?**

- (A) Food goes to the small intestine.
- (B) Acid kills bacteria in the food.
- (C) Food goes to the large intestine.
- (D) Saliva helps break down the food.

10 **One important thing to remember about all the body's systems is that _____.**

- (A) we have skin
- (B) they work together
- (C) they do not keep us healthy
- (D) we do not need most of our systems

11 **The most important thing that blood cells do is _____.**

- (A) carry oxygen, carbon dioxide, and nutrients through the body
- (B) digest food
- (C) pump blood through the body
- (D) move food through the intestines

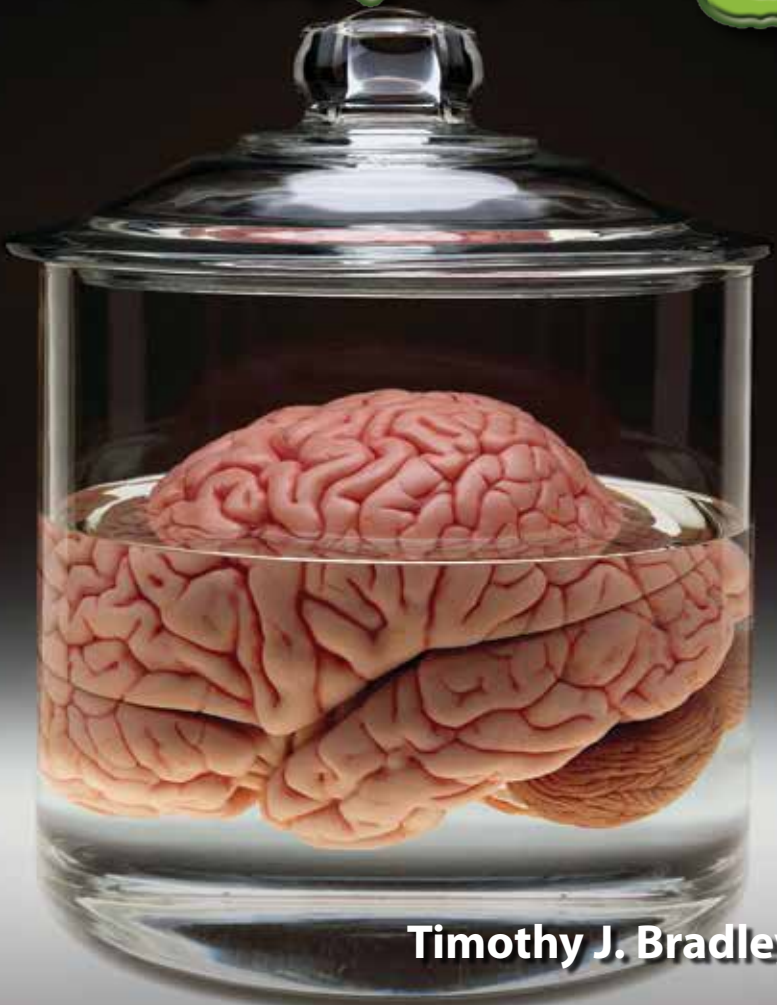
12 **Which of these would be a good title for this book?**

- (A) *Pump it Up! How the Heart Pumps Blood*
- (B) *Eating Well*
- (C) *Inside Out: How the Body Works*
- (D) *Your Muscles and Bones*

TIME FOR KIDS

STRANGE BUT TRUE

Gross Anatomy



Timothy J. Bradley

Consultants

Timothy Rasinski, Ph.D.
Kent State University

Lori Oczkus
Literacy Consultant

Dana Lambrose, M.S.N., P.M.H.N.P.
West Coast University

Publishing Credits

Dona Herweck Rice, *Editor-in-Chief*
Lee Aucoin, *Creative Director*
Jamey Acosta, *Senior Editor*
Lexa Hoang, *Designer*
Stephanie Reid, *Photo Editor*
Rane Anderson, *Contributing Author*
Rachelle Cracchiolo, *M.S.Ed., Publisher*

Image Credits: cover, p.1 Alamy; p.10 Corbis; p.31 Getty Images/Ikon Images; p.9 (top) National Geographic Stock; p.15 (top) AFP/Getty Images/Newscom; p.23 (bottom right) EPA/Newscom; p.9 (bottom) imago stock&people/Newscom; p.16 Reuters/Newscom; pp.10, 19 (top) Photo Researchers, Inc.; pp.8, 12–13, 15 (bottom), 19 (bottom), 21, 25, 28–29, 38–39 John Scahill; All other images from Shutterstock.

Teacher Created Materials
5301 Oceanus Drive
Huntington Beach, CA 92649-1030
http://www.tcmpub.com

ISBN 978-1-4333-4860-0

Table of Contents

Bizarre Biology

There's a lot more than just blood and guts inside the human body. There's gas, earwax, vomit, scabs, pus, boogers, and belches, too! From head to toe, our bodies are amazing—and gross!

Around 2,000 years ago, scientists began to peek inside. They began to **dissect** human bodies. From the outside, we may look pretty boring. But cut us open, and inside you'll find a world stranger than any planet.

Anatomy 101

Human anatomy is the part of science that deals with our body's structure. The words *gross anatomy* don't refer to parts of the body that are gross. They refer to parts of the body that can be studied with the human eye—no microscope required!

THINK LINK

1. What lies below our skin?
2. How do the different parts of the body work together?
3. How would our lives change if our bodies were different?

Bones and Muscles

What would happen if your bones and muscles suddenly disappeared? You would flop to the ground, unable to move or function. You would be a puddle of skin, blood, and guts. The only good news is you wouldn't be able to live very long in this state.

All animals need a stable frame to move around. The **organs** inside our bodies need to be protected. Fish, amphibians, birds, and mammals all have an internal skeleton. The skeleton supports the organs and protects the brain. The human skeleton is made of bone. A strong internal skeleton supports the body. It lets us do things like ride skateboards and climb trees.

Muscles and bones work together to support the body.

Boneheads

Every baby is born with a soft spot at the top of his or her head. This is where the bones in the skull haven't grown together yet. In the past, people tried to flatten children's skulls by pressing their skulls gently against a board. Bad idea!

Smooth Moves

Babies are born with over 250 bones. Over time, some of the bones fuse together. Adults only have 206 bones in their bodies.

No bones about it. Our skeletons hold us together. When you think of bones, you may picture the dry, hard bones you see in a museum. But our bones are alive. They grow and change just like the rest of the body. If a bone is broken, the body is able to repair it. New bone joins the broken ends, and the repaired bone may be as strong as it was before.

Bone is made of **calcium** and other elements. Calcium is very strong. **Ligaments** and **tendons** hold the bones together. Joints are formed where the bones meet. The elbow is one of the most used joints in the body. To keep the bones from rubbing against each other, pads of **cartilage** (KAR-tl-ij) cushion the joints. Throughout the day, cartilage shrinks. That's why we're taller in the morning and shorter at night!

Foot Binding

For generations, many Chinese girls had their feet bound. Their toes were broken, tucked under, and then bandaged. Repeated bindings prevented the feet from growing to full size. Women with these tiny feet were admired. Some wore shoes as small as three inches. Today, foot binding is illegal.

Beautiful Bones

The Padaung people in Thailand are famous for their long necks. Padaung women wear metal rings on their necks. Over time, these rings push down the collarbone and rib bones in the chest. This gives the illusion of a very long neck, which is believed to be beautiful.

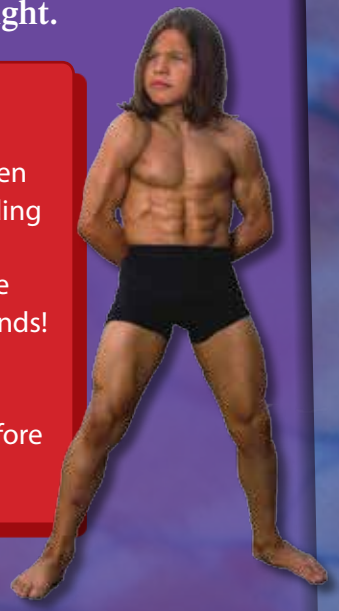
Muscles

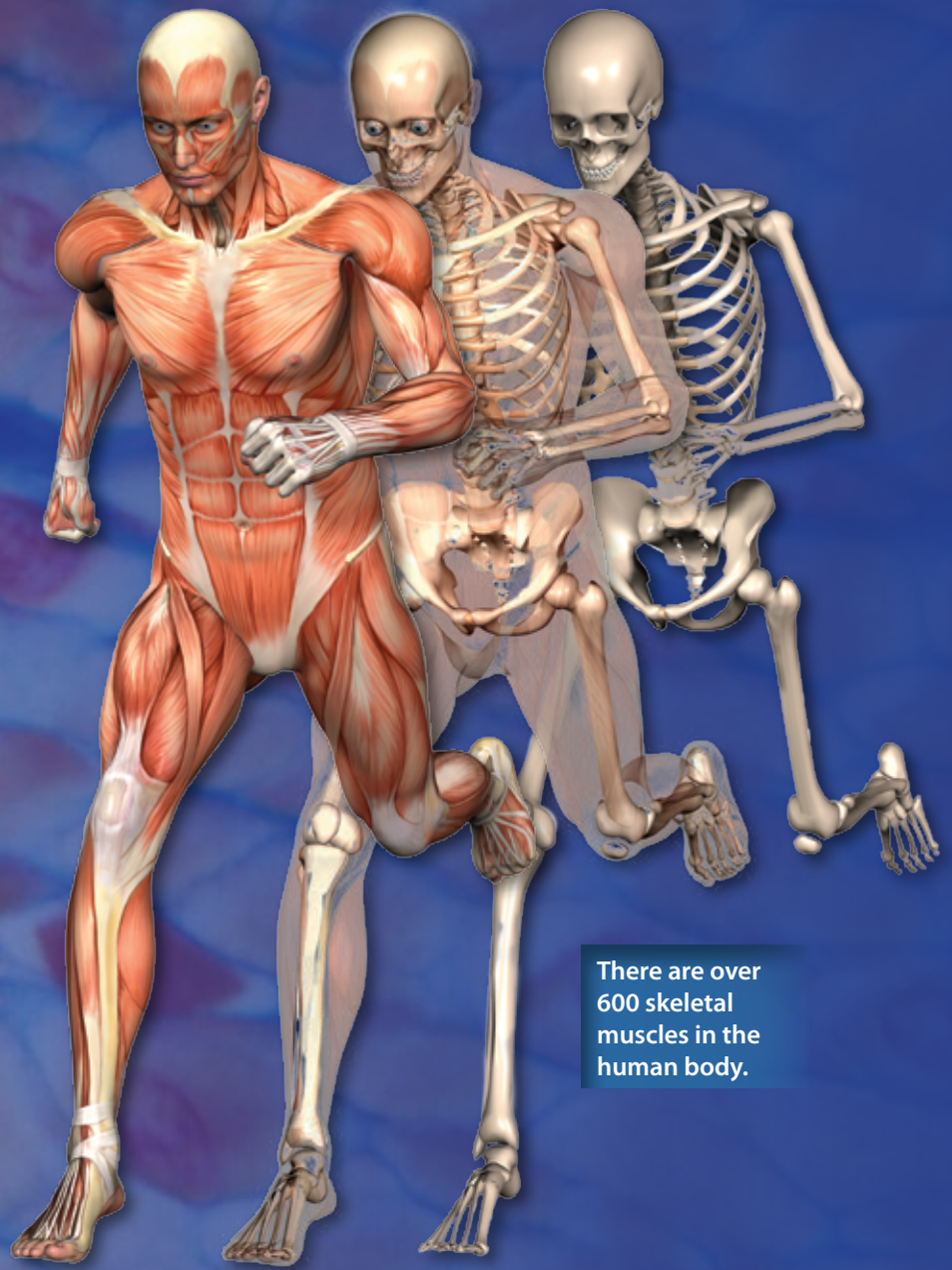
Muscles make it possible for the human body to move. They help us lift boxes, talk, and digest food. **Skeletal muscles** are the muscles most people are thinking of when they say *muscle*. They are tied to the skeleton with tendons and ligaments. **Smooth muscle** is used in **peristalsis** (per-uh-STAWL-sis) to push food through the body (down if you're lucky, up if you're not). **Cardiac muscle** never needs to rest like skeletal muscle does. The only time your heart rests is in between beats.

The heart may be the most important muscle in the body. But **sphincter** (SFINGK-ter) **muscles** are a close second. A sphincter is a ring-shaped smooth muscle. It opens and closes important areas of the body. One sphincter holds the food inside the stomach until it is ready to move on. Other sphincters hold waste in the body until it's time to go to the bathroom. A sphincter in the eye shrinks the pupil in bright light.

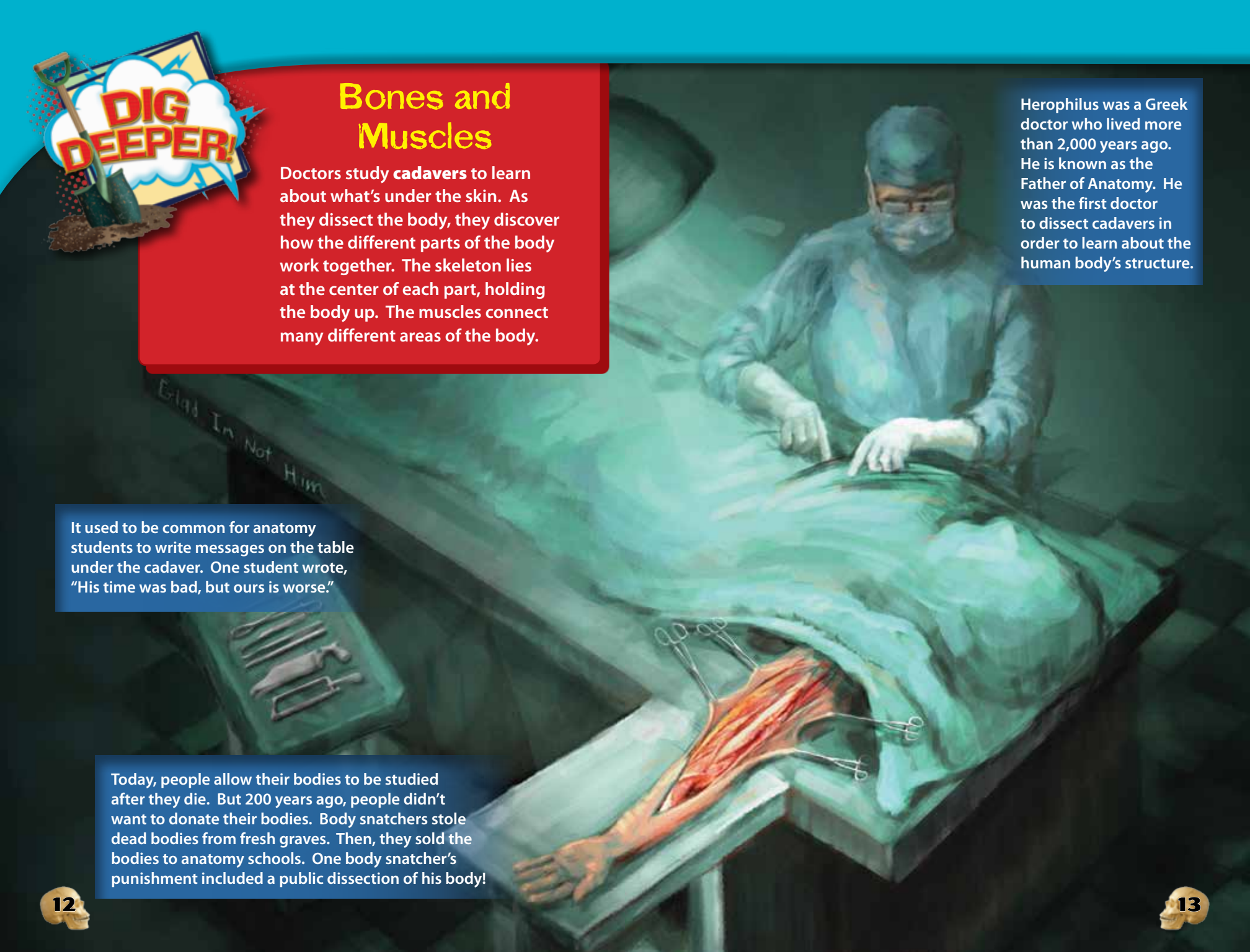
Little Hercules

Richard Sandrak is known as Little Hercules. When he was young, he started training for body-building and martial-arts competitions. At 8 years old, weighing 80 pounds, he could bench-press more than twice his own weight—that's over 150 pounds! Just remember, lifting too much weight when your bones and muscles are still growing can be dangerous. Talk to your doctor or PE teacher before starting any weight-lifting program.





There are over 600 skeletal muscles in the human body.


DIG DEEPER!
Bones and Muscles
Doctors study **cadavers** to learn about what's under the skin. As they dissect the body, they discover how the different parts of the body work together. The skeleton lies at the center of each part, holding the body up. The muscles connect many different areas of the body.
Herophilus was a Greek doctor who lived more than 2,000 years ago. He is known as the Father of Anatomy. He was the first doctor to dissect cadavers in order to learn about the human body's structure.
It used to be common for anatomy students to write messages on the table under the cadaver. One student wrote, "His time was bad, but ours is worse."
Today, people allow their bodies to be studied after they die. But 200 years ago, people didn't want to donate their bodies. Body snatchers stole dead bodies from fresh graves. Then, they sold the bodies to anatomy schools. One body snatcher's punishment included a public dissection of his body!

Skin cells work together to form the largest organ in the body. The skin acts as a giant shield against disease. Every scab and scar is a sign of the hard work skin does. Your skin protects your body from millions of **microorganisms**, including **bacteria**. Three million sweat **glands** in your skin help the body stay cool. We feel heat, pressure, and pain through our skin. And let's face it, skin makes us a little easier to look at!

Skin Planet

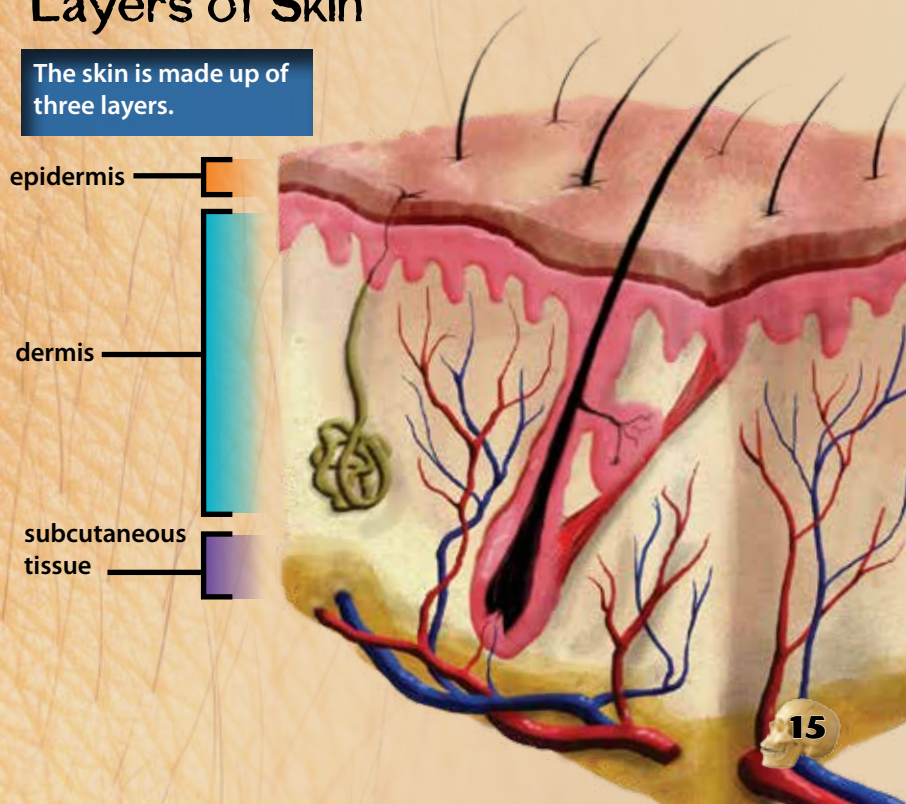
Think of your skin as a planet. The kind of bacteria that exists between the eyebrows is different from the kind found on the tip of the nose. Some areas of the skin are dry. Other areas are filled with oil. Just as some animals can survive in harsh places like the desert, only some bacteria do well on dry areas of skin. Others will only survive on oily patches.

Skin Twins

Can you imagine sharing your skin with someone else? Conjoined twins share skin as well as other organs. Some conjoined twins are attached at the head. Others are attached at lower points in the body. Doctors are finding ways to separate these twins so each can live his or her own healthy life.

Layers of Skin

The skin is made up of three layers.



Face Transplants

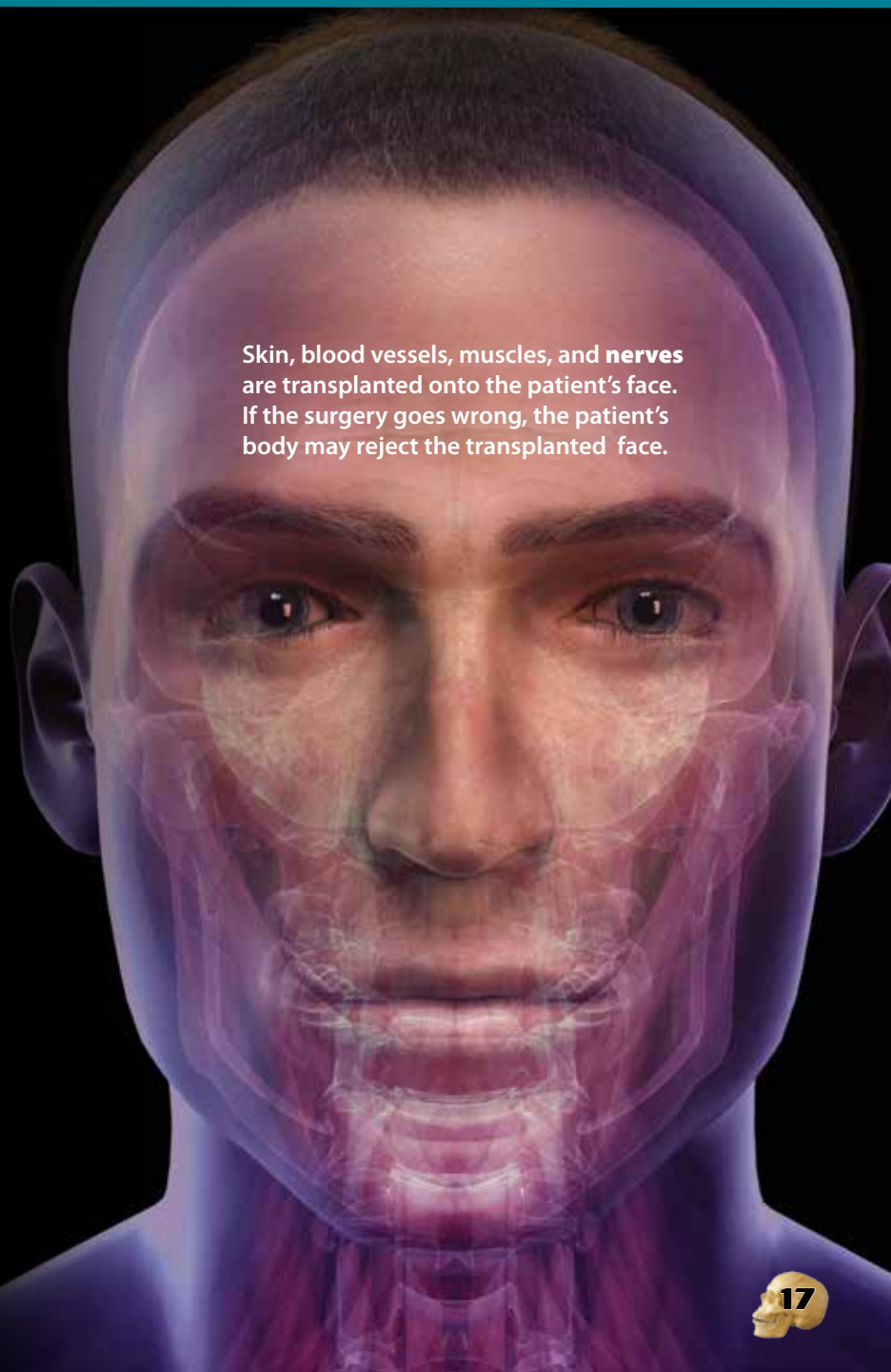
In a face transplant, facial tissue from a recently **deceased** person is sewn onto a patient with serious injuries. If the surgery goes well, the patient may be able to breathe and speak more clearly. In time, he or she may even show facial expressions again. The first face transplant was done in 2010.

Before

After

Dallas Wiens's face was severely burned by a live electrical wire. He was the first person in the United States to have a full face transplant.

Wiens was inspired to recover by his young daughter.



Skin, blood vessels, muscles, and **nerves** are transplanted onto the patient's face. If the surgery goes wrong, the patient's body may reject the transplanted face.

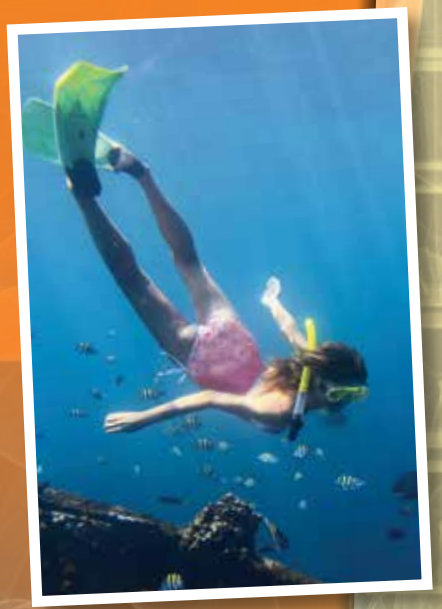
Respiration and Circulation

One breath in, one breath out. **Respiration**, or breathing, seems like a simple process. We do it without thinking. Whether we're singing, walking, running, or just thinking, we're breathing.

First, **oxygen** enters through the nose or mouth. The oxygen flows into the lungs and passes into the blood. Cells deliver waste back to the lungs. **Carbon dioxide** leaves the body on the exhale. This simple cycle is what keeps us alive.

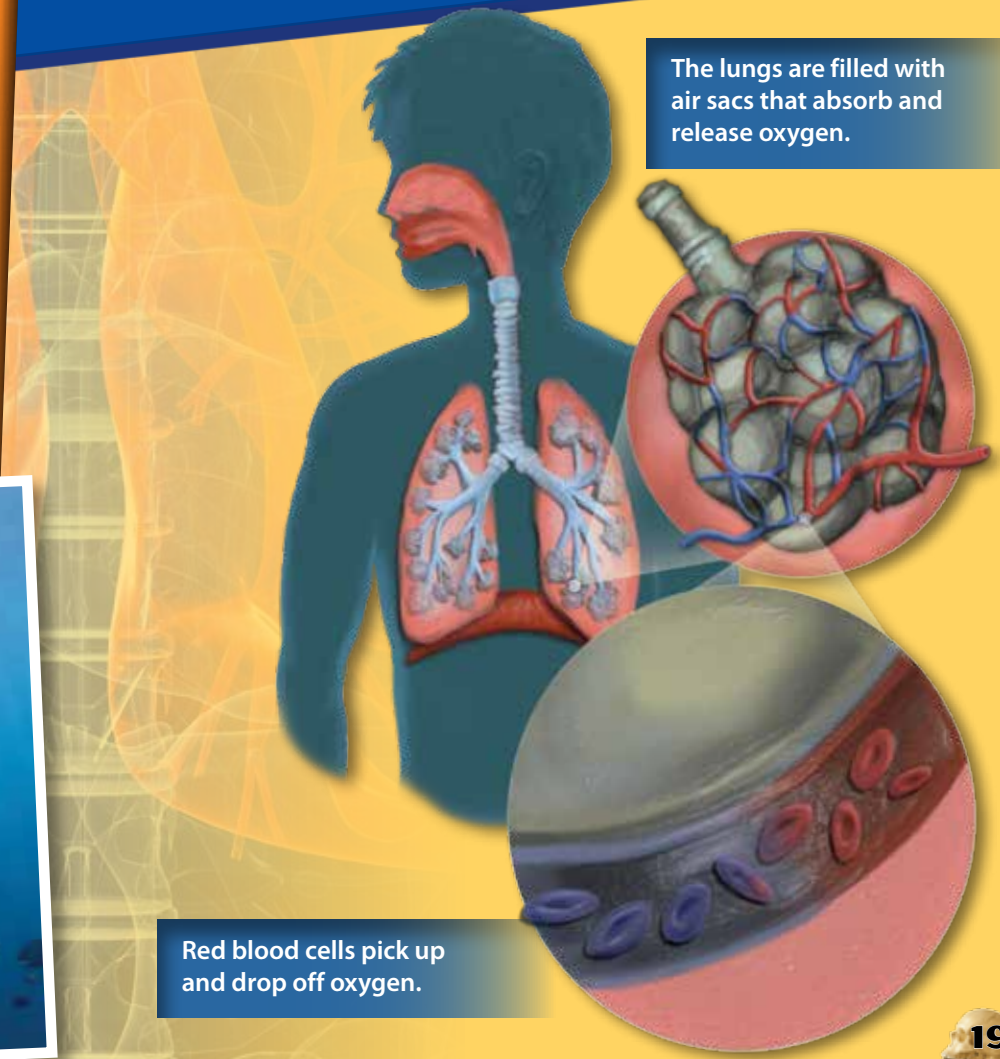
Gulp!

Swimmers practice holding their breath so they can stay under water longer. Ricardo da Gama Bahia is the world record holder. He held his breath for over 20 minutes. The only way to do this is with medical help. Da Gama Bahia inhaled pure oxygen for 20 minutes before his attempt.



There He Blows!

A cough happens when the lungs push air quickly and forcefully out of the mouth. Thousands of small saliva droplets fly in a single cough. Some of those droplets can fly at up to 60 miles per hour!



The lungs are filled with air sacs that absorb and release oxygen.

Red blood cells pick up and drop off oxygen.

Circulation

The **circulatory system** is the highway of the body. Red blood cells act like dump trucks in a city. They carry oxygen and **nutrients** to all the organs in the body. The heart sets the pace. Fresh oxygenated blood moves from the lungs to the heart, where it is sent around the body. Blood cells carry oxygen throughout the body. Then, they come back to the heart and lungs to drop off carbon dioxide. It's time to pick up more oxygen.

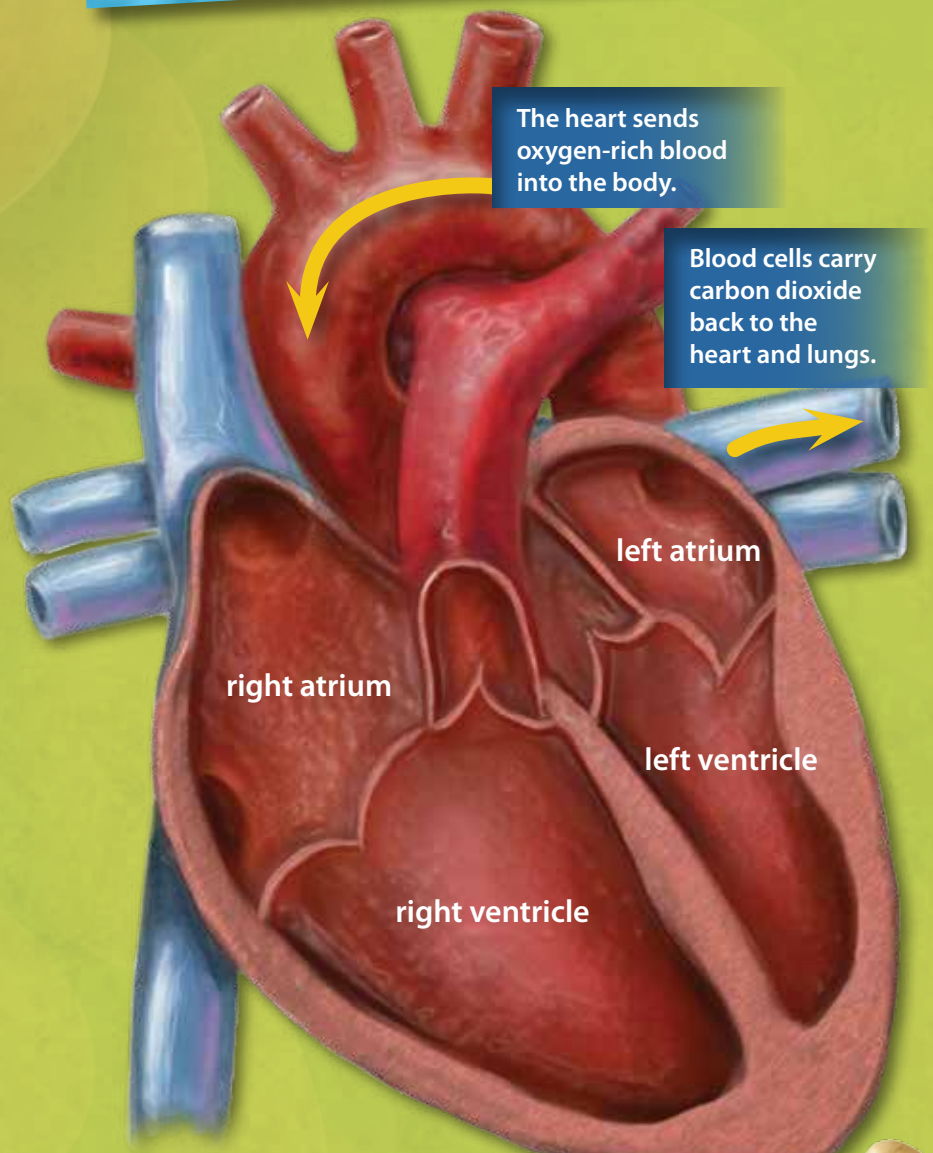
Blood Bath

In the past, doctors often didn't know how to treat people who were sick or in pain. They believed that bleeding could cure the patient because it let the illness out. Leeches were often used for this process. Unfortunately, it usually only made patients weaker. Extreme bleeding, or **bloodletting**, can be a painful and slow way to die.

The human heart can pump five liters of blood around the body in just one minute.

The Human Heart

The right and left sides of the heart are labeled in this diagram as though the heart was looking out from the body.



Red Gold

Blood is known as *red gold* because it is so valuable. We can't live without it. In the United States, patients need blood transfusions every two seconds. They need blood from someone else to survive. They may be sick, or they may have lost blood in surgery or an accident. Thousands of people donate blood every year. Their blood is used in transfusions to save lives. Here's what happens.

1. A healthy person donates a pint of blood. Donors must be at least 17 years old to donate. Donating blood takes about an hour.

2. The blood is tested and processed. The different parts of the blood are separated. A single donation can save three lives.

3. Each unit of blood is assigned a code. This helps doctors track the blood and make sure it stays safe.

4. Blood is sent to hospitals around the country. Stored in refrigerators, the blood is safe from disease.

5. When a patient needs blood, a transfusion is given. Donated blood is pumped into the patient. In time, the patient may one day grow strong enough to donate blood as well.

- Why do you think only 10 percent of people donate blood?
- What other names would you use to describe blood?
- What do you think is the most important step in this process?

Digestion

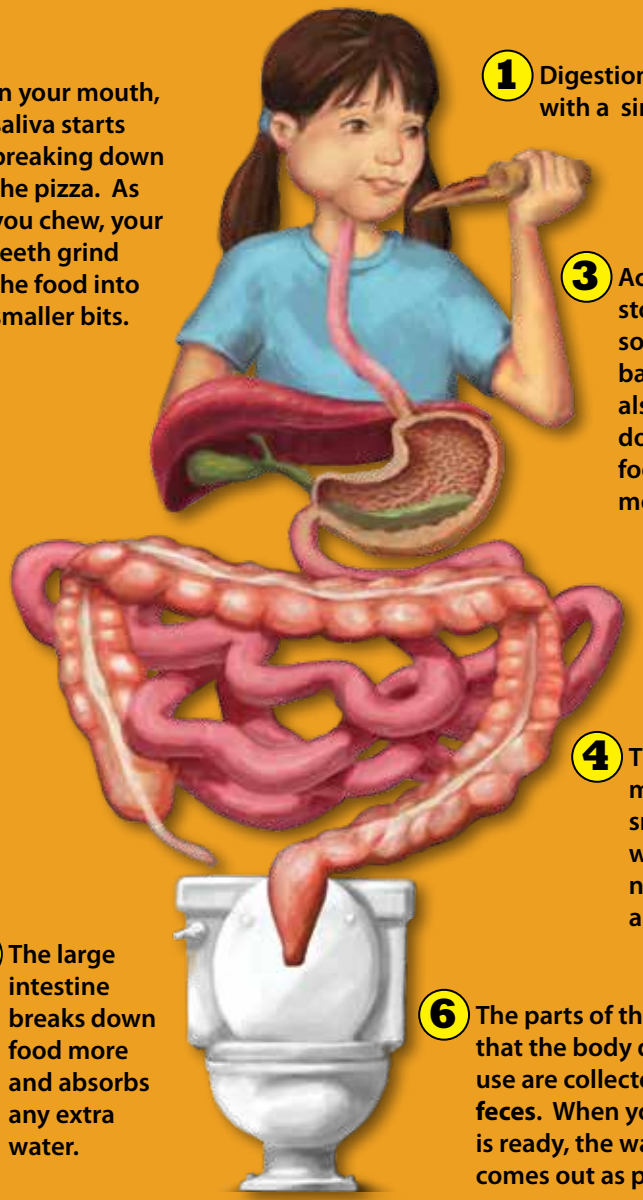
The food you eat and drink gives your body energy. Your **digestive system** takes in nutrients from food. These nutrients travel on through the circulatory system to reach the rest of the body. It's a long journey, but it's worth it. These nutrients keep your body healthy, help it grow, and give you the energy to work and play.

Along the way, it can be a messy ride from food to poop! A normal meal can cause burps, gas, and ferociously bad breath. And a bad meal can come up in the form of vomit!

I'm Stuffed

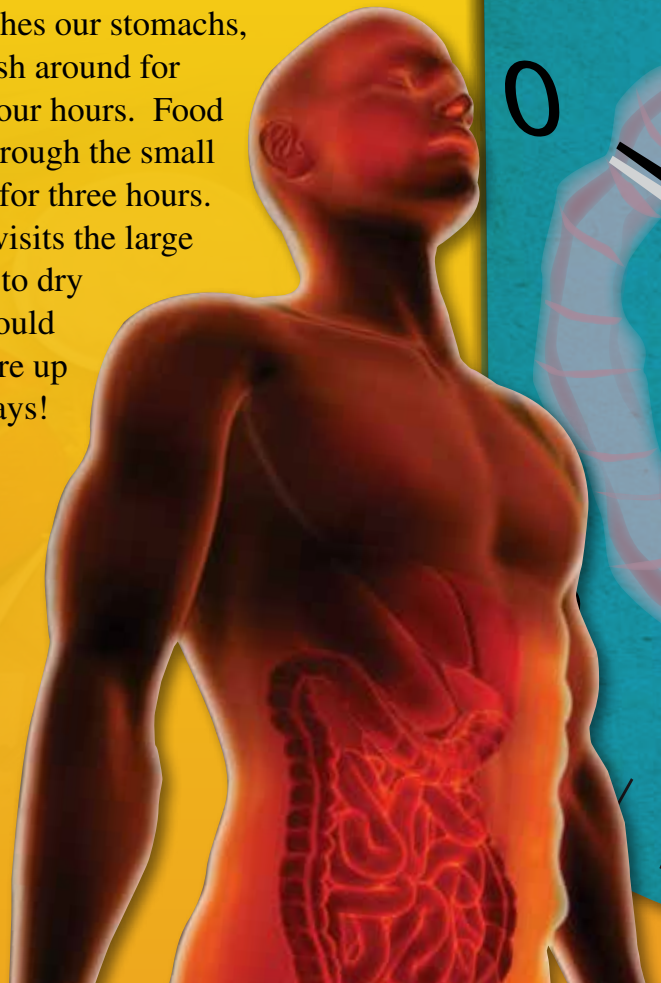
The large intestine is about five feet long! It is coiled up so it can fit inside your body.

How Food Becomes Poop



1. Digestion starts with a single bite.
2. In your mouth, saliva starts breaking down the pizza. As you chew, your teeth grind the food into smaller bits.
3. Acid in your stomach kills some of the bacteria. It also breaks down the food even more.
4. This mush moves to the small intestine where the nutrients are absorbed.
5. The large intestine breaks down food more and absorbs any extra water.
6. The parts of the food that the body doesn't use are collected as **feces**. When your body is ready, the waste comes out as poop!

No one can deny that humans love to eat. We eat many different kinds of foods, and we each have our favorites. But when it comes to digestion, there are certain things every human has in common. It takes us between 5 and 30 seconds to chew a bite of food. It takes about 10 seconds to swallow. When the food reaches our stomachs, it can slosh around for three to four hours. Food travels through the small intestine for three hours. Then, it visits the large intestine to dry out. It could be in there up to two days!



Tick Tock

Food breaks down differently in our bodies. Some foods are hard to digest and others are easier, depending on the nutrients inside. Foods that are easier to digest pass through the body quickly. Foods that are harder to digest can spend time rotting in the intestine. It can take days before they become feces.

parsley

1 hour

blueberries

2 hours

broccoli

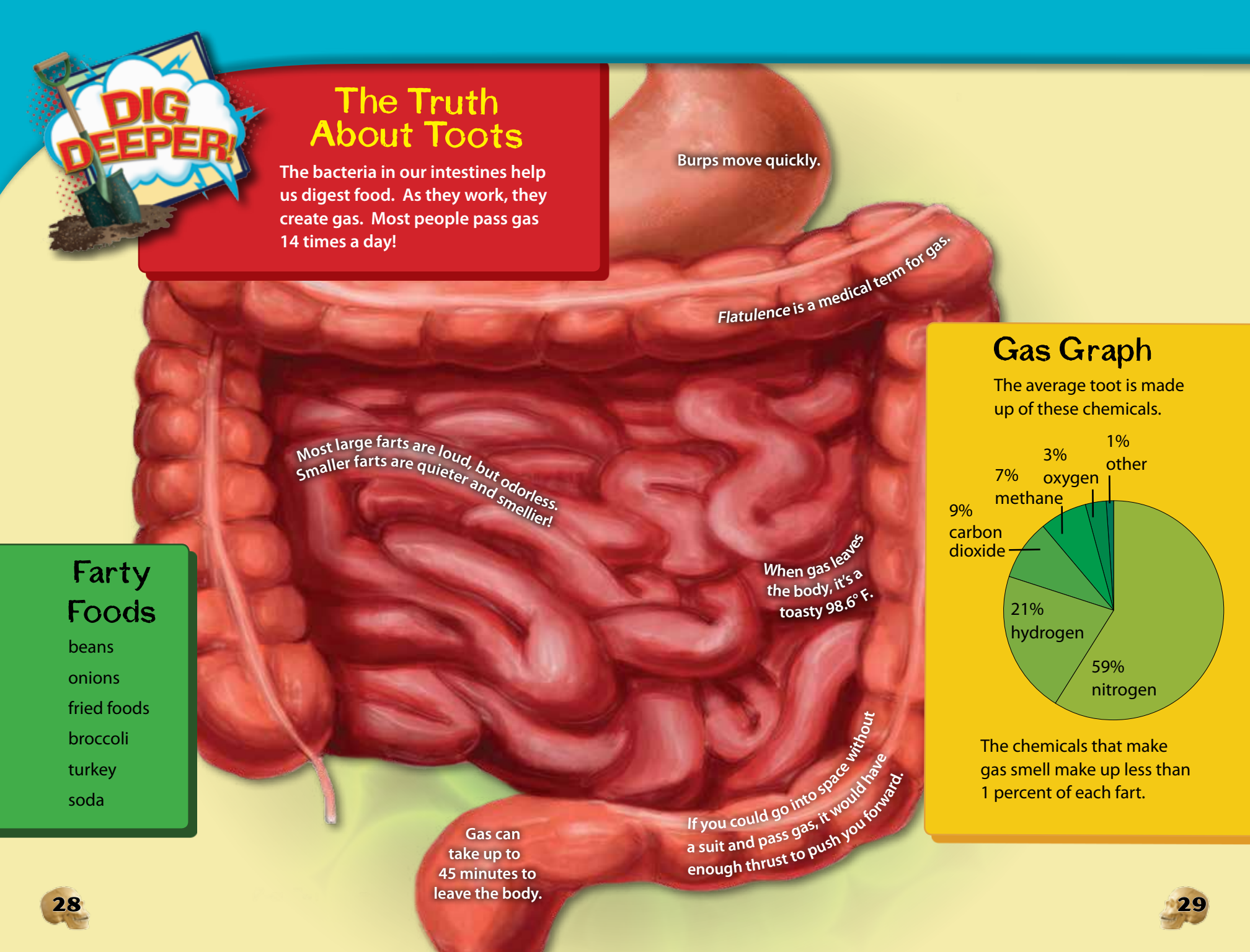
3 hours

brussels sprouts

4 hours

hamburger

more than 5 hours



The Truth About Toots

The bacteria in our intestines help us digest food. As they work, they create gas. Most people pass gas 14 times a day!

Burps move quickly.

Flatulence is a medical term for gas.

Most large farts are loud, but odorless. Smaller farts are quieter and smellier!

When gas leaves the body, it's a toasty 98.6° F.

If you could go into space without a suit and pass gas, it would have enough thrust to push you forward.

Gas can take up to 45 minutes to leave the body.

Farty Foods

- beans
- onions
- fried foods
- broccoli
- turkey
- soda

Gas Graph

The average toot is made up of these chemicals.

The chemicals that make gas smell make up less than 1 percent of each fart.

The Five Senses

It's hard to imagine life without our senses. They give us details about the world and help us survive. Sounds move in waves through air, water, and other objects. The outside of the ear directs sounds into the inner ear. Sound waves hit the ear—as long as they aren't filled with wax! The brain interprets the sound waves and tells us what we're hearing.

Clear that gunk out of your eyes! It's time to give the eyes a second look. Eyes collect information about the world. Light passes through the eye. The **retina** at the back of the eye absorbs the light. The brain makes sense of what the eyes see. Eyes are placed in the skull so we can see how far away things are. They help us watch baseball games, admire paintings, and see our families. Tears keep the eyes moist and healthy. Eyelashes protect the eyes from painful intruders like dust and sand.

Mixed Messages

People who experience **synesthesia** associate one sense with another. For example, they may hear a particular sound when they smell a rose. They might taste chocolate when they hear a violin play. Many associate a certain color with a specific number or letter.

Human eyes can distinguish between 500 shades of gray and 10 million colors.

Earwax protects the ear from dust, dirt, and infection.

The human mouth can detect the flavor of foods, minerals, and poisons. Taste buds are arranged in patches on the top of the tongue. There are five basic tastes: sweet, bitter, sour, salty, and **umami** (oo-MAH-mee). *Umami* is a Japanese word that means "good taste." It is used to describe something that has a rich, long-lasting taste. Some cheeses, mushrooms, and meats have this taste.

Special cells inside the nose detect chemicals in the air. Those cells send messages to the brain. Smells can be good, like apple pie or pine trees. Or they can be bad, like rotting fish or skunk. Bad odors often warn of something that could cause disease.

You can feel the soft pillow against your face or the sharp rock underfoot thanks to nerve endings. Nerves in the skin detect **stimuli** (STIM-yuh-lahy) like heat, cold, or pressure. The nerve endings send a signal to the brain. These signals protect the body from danger.

The sense of taste is so dependent on the sense of smell that if you plugged your nose, you probably couldn't tell if you were biting into a crisp apple or a raw onion.

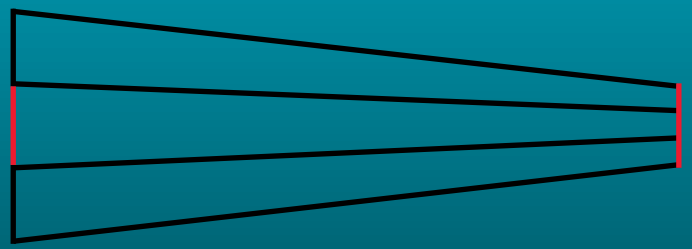
Humans can distinguish among 10,000 different scents.

We have extra nerves in our hands and lips. These are some of the most sensitive parts of the body.

Boggling the Brain

We depend on our senses to understand the world around us, and usually they don't deceive us. But once in a while, something goes wrong. Our senses can mislead us. They can trick us into believing something that isn't true.

Optical illusions are designed to fool your brain. Often, these tricks of the eye are based on the placement of objects in relation to one another. Look at the picture below. Are the red lines equal in size? The one on the right looks bigger, doesn't it? It's not. Your brain was tricked!



Falling Asleep

You are just about to drift off to dreamland when suddenly, you feel like you're falling and your body jerks awake. One theory is that this *hypnic jerk* happens when your muscles begin to relax. Perhaps the brain interprets this relaxation as a sign that you're falling and alerts your body to stay upright. Do you think that's what is meant by "falling" asleep?

Exercise isn't just good for the muscles. It keeps the brain in good working order, too.

Phantom Limbs

Imagine you have 11 fingers. Now, squeeze that invisible finger as hard as you can. Did you feel anything? Common sense tells us, "No, it isn't really there." Often, people who have had an arm or a leg **amputated** sometimes still feel the missing part. They might feel pain, an itch, or a twitch. Sometimes, they feel like they are moving the missing part of their body, or phantom limb.

The Brain

Your brain does all the thinking. But have you done any thinking about the brain? The brain helps you remember phone numbers, and it knows how to make you talk and walk. The human brain invented computers and baseball. This is where our feelings, dreams, and new ideas come from.

The brain is the most complex part of our body. And it is the control center for everything else. This important organ receives information from the nerves. It also sends messages to other parts of your body. The brain monitors all the systems in the body. It keeps the body in a state of **homeostasis** (HOH-mee-uh-STEY-sis).

If you touch it, the brain feels like firm jelly.

Ouch!

Modern doctors know the brain is fragile. In the past, the risks of brain surgery weren't as clear—but that didn't stop people from trying. Many ancient skulls have been found with holes in them. These brutal surgeries were used to treat headaches, epilepsy, and mental illness.

Some people say the brain looks gray. Others say it looks pink, green, or even blue!

DIG DEEPER!

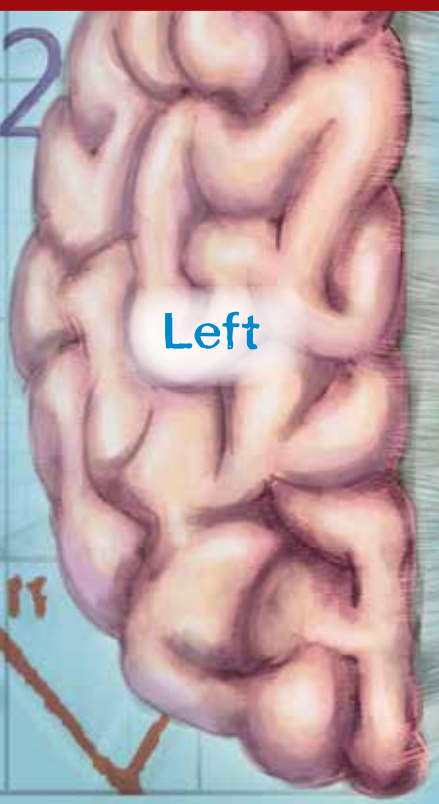
Two Heads Are Better Than One

The human brain is made up of two **hemispheres** (HEM-i-sfeerz). Each side controls the opposite side of the body and is responsible for different types of thoughts. A thick band of nerves connects the two sides of the brain. This lets the hemispheres share information with each other.

The left side of the brain controls the right side of the body. This side of the brain helps us speak, make decisions, and analyze facts.

If you are right-handed, you are mostly "left-brained."

"Left-brainers" are more often logical and focused on details.



Just as you are right-handed or left-handed, most people have one side of the brain that's stronger than the other.

The right side of the brain is good at hands-on activities, making art, and listening to music.

If you're left-handed, you're most likely "right-brained."

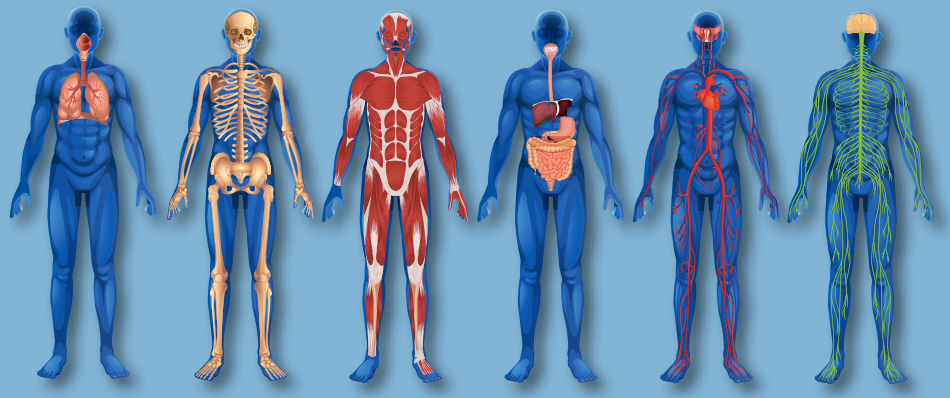
"Right-brainers" are thought to be artistic and interested in big ideas.

Human Body 2.0

The human body has built giant cities, vehicles that can fly, and beautiful works of art. Humans have gone into space and traveled deep into the ocean. Our bodies let us lift enormous weights, feel amazing emotions, and have brilliant new ideas.

We have to travel great distances to explore new planets, but the study of gross anatomy allows us to view the strange landscapes of our own body's interior without going anywhere. We get the chance to see ourselves from the inside out—literally!

Every Part Works Together



Lungs | Bones | Muscles | Digestive System | Heart | Brain and Nerves

Glossary

amputated—cut off

bacteria—tiny one-celled life-forms

bloodletting—the practice of opening a vein and letting blood out in the hope of curing illnesses

cadavers—dead bodies dissected for study

calcium—a material that bones are made of

carbon dioxide—a waste product made by cells during respiration

cardiac muscle—special muscle that makes up the heart

cartilage—a firm, flexible type of connective tissue

circulatory system—the system of the body that includes the heart and blood vessels

deceased—no longer living

digestive system—the system of the body that breaks food into nutrients and waste

dissect—to cut open something to examine it

feces—solid waste that is eliminated from the body

glands—organs that secrete chemicals

hemispheres—half-sections of the brain

homeostasis—a state of stability when the body's systems are all working properly

ligaments—bands of tissues that connect bones or hold organs in place

microorganisms—very small living things that can only be seen with a microscope

nerves—cells that transmit signals to the brain or spinal cord

nutrients—elements necessary for life and health

organs—parts of the body that perform specific functions

oxygen—an element found in air that supports life

peristalsis—muscle contractions that move food through the digestive system

respiration—the act or process of breathing

retina—the area at the back of the inner eyeball that absorbs light

skeletal muscles—muscle tissues that are connected to the skeleton

smooth muscle—muscle tissue that contracts without voluntary control

sphincter muscles—ring-shaped smooth muscles that close a bodily opening

stimuli—events or things that cause a reaction from living things

synesthesia—a condition that includes a sensation (such as color) other than the one (such as sound) being stimulated

tendons—bands of tissue that connect muscles to bones

umami—a Japanese word used to describe one of the basic tastes that is rich and long lasting

Index

Bibliography

Daynes, Katie and Colin King. *See Inside Your Body.* Usborne Books, 2006.

Take a hands-on approach to learning. This lift-the-flap anatomy book follows the pathways of digestion and respiration.

Gould, Francesca. *Why You Shouldn't Eat Your Boogers and Other Useless or Gross Information About Your Body.* Tarcher, 2008.

Broken down by system, this book is full of awesome facts about human anatomy. Do *you* know how astronauts poop in space?

Green, Dan and Simon Basher. *Basher Science: Human Body: A Book with Guts.* Kingfisher, 2011.

Cells, DNA, bones, muscles, and other organs are all explained in colorful, memorable detail in this book.

Jankowski, Connie. *Investigating the Human Body.* Teacher Created Materials, 2008.

Find out what characteristics all seven billion humans on the planet share. This book explains how scientists study the human body.

More to Explore

Mutter Museum

http://www.collegeofphysicians.org/mutter-museum

This unusual medical museum includes preserved body parts such as Einstein's brain and exhibits on diseases and medicines.

Body Worlds: The Original Exhibition of Real Human Bodies

http://www.bodyworlds.com

These exhibitions include cross-sections of the human body and its parts using a process developed by Gunther von Hagens called *plastination*. The exhibit travels worldwide. Check out the schedule online to see if it will be visiting a city near you.

KidsHealth

http://kidshealth.org/kid

This site includes movies, games, recipes, and medical dictionaries that cover every major system in the body.

MEDtropolis: Home of the Virtual Body

http://www.medtropolis.com

This website is intended to educate kids and adults with the latest health information, including features like Health Calculators, Kids Health, and the Virtual Body.

About the Author

Timothy J. Bradley grew up near Boston, Massachusetts, and spent every spare minute drawing spaceships, robots, and dinosaurs. That was so much fun that he started writing and illustrating books about natural history and science fiction. He loves to create new creatures based on real bizarre animals. He also worked as a toy designer for Hasbro, Inc., and designed life-size dinosaurs for museum exhibits. As an artist, he has studied human anatomy for many years. Timothy lives in sunny Southern California with his wife and son.