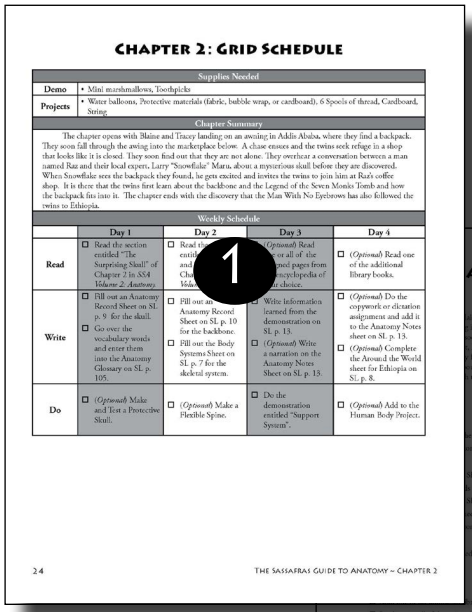
Activity Guide At-A-Glance

Take an adventure-filled journey to learn about science!

1. & 2. Scheduling Options

Choose from a grid-style schedule (1) or a list-style schedule (2). Either way, these scheduling options will make planning your weekly science adventure a snap! These schedule sheets include a summary of the chapter in case your students are reading the novel or listening to the audiobook on their own.



Chapter 2: Grid Schedule

Supplies Needed	
Demo	• Mini marshmallows, Toothpicks
Projects	• Water balloons, Protective materials (fabric, bubble wrap, or cardboard), 6 Spools of thread, Cardboard, String

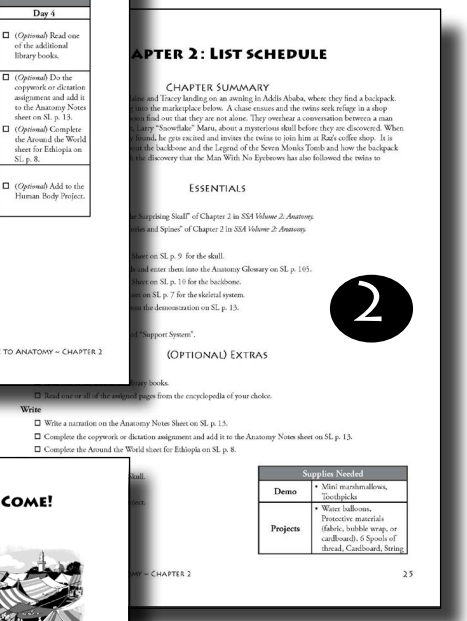
Chapter Summary

The chapter opens with Blaine and Tracey landing on an awning in Addis Ababa, where they find a backpack. They soon fall through the awing into the marketplace below. A chase ensues and the twins seek refuge in a shop that looks like it is closed. They soon find out that they are not alone. They overhear a conversation between a man named Raz and their local expert, Larry "Snowflake" Maru, about a mysterious skull before they are discovered. When Snowflake sees the backpack they found, he gets excited and invites the twins to join him at Raz's coffee shop. It is there that the twins first learn about the backbone and the Legend of the Seven Monks Tomb and how the backpack fits into it. The chapter ends with the discovery that the Man With No Eyebrows has also followed the twins to Ethiopia.

Weekly Schedule

	Day 1	Day 2	Day 3	Day 4
Read	☐ Read the section entitled "The Surprising Skull!" of Chapter 2 in *SSA Volume 2: Anatomy.*	☐ Read th… entit… and… Cha… Volu…	☐ *(Optional)* Read one or all of the assigned pages from the encyclopedia of your choice.	☐ *(Optional)* Read one of the additional library books.
Write	☐ Fill out an Anatomy Record Sheet on SL p. 9 for the skull. ☐ Go over the vocabulary words and enter them into the Anatomy Glossary on SL p. 105.	☐ Fill out an Anatomy Record Sheet on SL p. 10 for the backbone. ☐ Fill out the Body Systems Sheet on SL p. 7 for the skeletal system.	☐ Write information learned from the demonstration on SL p. 13. ☐ *(Optional)* Write a narration on the Anatomy Notes Sheet on SL p. 13.	☐ *(Optional)* Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 13. ☐ *(Optional)* Complete the Around the World sheet for Ethiopia on SL p. 8.
Do	☐ *(Optional)* Make and Test a Protective Skull.	☐ *(Optional)* Make a Flexible Spine.	☐ Do the demonstration entitled "Support System".	☐ *(Optional)* Add to the Human Body Project.

1



…apter 2: List Schedule

Chapter Summary

…ne and Tracey landing on an awning in Addis Ababa, where they find a backpack. …ow the marketplace below. A chase ensues and the twins seek refuge in a shop …een find out that they are not alone. They overhear a conversation between a man …Larry "Snowflake" Maru, about a mysterious skull before they are discovered. When …nowflake sees the backpack they found, he gets excited and invites the twins to join him at Raz's coffee shop. It is …t the backbone and the Legend of the Seven Monks Tomb and how the backpack …s the discovery that the Man With No Eyebrows has also followed the twins to …

Essentials

…e Surprising Skull" of Chapter 2 in *SSA Volume 2: Anatomy.*
…bows and Spines" of Chapter 2 in *SSA Volume 2: Anatomy.*

…Sheet on SL p. 9 for the skull.
…and enter them into the Anatomy Glossary on SL p. 105.
…Sheet on SL p. 10 for the backbone.
…on SL p. 7 for the skeletal system.
…the demonstration on SL p. 13.

2

…"Support System".

(Optional) Extras

…brary books.
☐ Read one or all of the assigned pages from the encyclopedia of your choice.

Write

☐ Write a narration on the Anatomy Notes Sheet on SL p. 13.
☐ Complete the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 13.
☐ Complete the Around the World sheet for Ethiopia on SL p. 8.

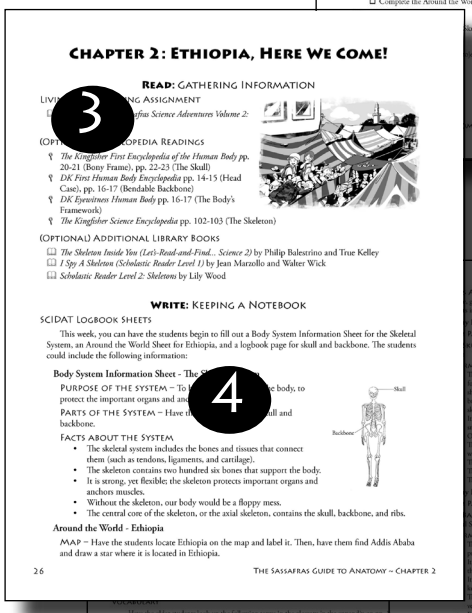
Supplies Needed	
Demo	• Mini marshmallows, Toothpicks
Projects	• Water balloons, Protective materials (fabric, bubble wrap, or cardboard), 6 Spools of thread, Cardboard, String

…ter ~ Chapter 2 25

Read

3. Reading Assignments

Know what to read each week in the corresponding Sassafras Science novel. Plus, get options for additional encyclopedia pages to read and for books to check out from the library. The novel contains the essential information for each week, but if you want to dig deeper, we've got you covered!



Chapter 2: Ethiopia, Here We Come!

Read: Gathering Information

Liv… Assignment

…fas Science Adventures Volume 2:

(Opt… …opedia Readings

- *The Kingfisher First Encyclopedia of the Human Body* pp. 20-21 (Bony Frame), pp. 22-23 (The Skull)
- *DK First Human Body Encyclopedia* pp. 14-15 (Head Case), pp. 16-17 (Bendable Backbone)
- *DK Eyewitness Human Body* pp. 16-17 (The Body's Framework)
- *The Kingfisher Science Encyclopedia* pp. 102-103 (The Skeleton)

3

(Optional) Additional Library Books

- *The Skeleton Inside You (Let's-Read-and-Find... Science 2)* by Philip Balestrino and True Kelley
- *I Spy A Skeleton (Scholastic Reader Level 1)* by Jean Marzollo and Walter Wick
- *Scholastic Reader Level 2: Skeletons* by Lily Wood

Write: Keeping a Notebook

SCIDAT Logbook Sheets

This week, you can have the students begin to fill out a Body System Information Sheet for the Skeletal System, an Around the World Sheet for Ethiopia, and a logbook page for skull and backbone. The students could include the following information:

Body System Information Sheet - The S…

Purpose of the System – To … the body, to protect the important organs and …

Parts of the System – Have … skull and backbone.

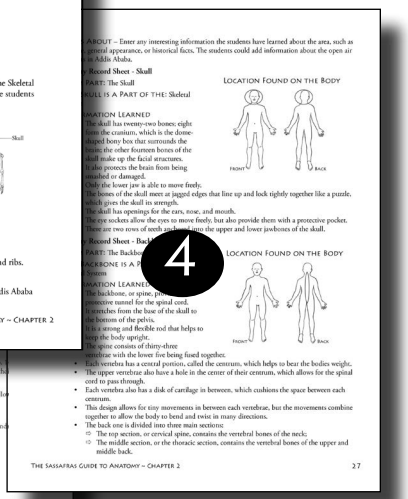
4

Facts about the System

- The skeletal system includes the bones and tissues that connect them (such as tendons, ligaments, and cartilage).
- The skeleton contains two hundred six bones that support the body.
- It is strong, yet flexible; the skeleton protects important organs and anchors muscles.
- Without the skeleton, our body would be a floppy mess.
- The central core of the skeleton, or the axial skeleton, contains the skull, backbone, and ribs.

Around the World - Ethiopia

Map – Have the students locate Ethiopia on the map and label it. Then, have them find Addis Ababa and draw a star where it is located in Ethiopia.



…ABOUT – Enter any interesting information the students have learned about the area, such as …general appearance, or historical facts. The students could add information about the open air …in Addis Ababa.

…Record Sheet - Skull

…PART: The Skull

…SKULL IS A PART OF THE: Skeletal …

Location Found on the Body

…RMATION LEARNED

…The skull has twenty-two bones; eight …from the cranium, which is the dome-…shaped bony box that surrounds the …brain; the other fourteen bones of the …skull make up the facial structures.
…It also protects the brain from being …smashed or damaged.
…Only the lower jaw is able to move freely.
…The bones of the skull meet at jagged edges that line up and lock tightly together like a puzzle, …which gives the skull its strength.
…The skull has openings for the ears, nose, and mouth.
…The eye sockets allow the eyes to move freely, but also provide them with a protective pocket.
…There are two rows of teeth and … the upper and lower jawbones of the skull.

4

…Record Sheet - Ba…

…PART: The Backb…

…BACKBONE IS A P… …System.

Location Found on the Body

…RMATION LEARNED

…The backbone, or spine, pro… protective tunnel for the spinal cord.
…It stretches from the base of the skull to the bottom of the pelvis.
…It is strong and flexible rod that helps to keep the body upright.
…The spine consists of thirty-three vertebrae with the lower five being fused together.

- Each vertebra has a central portion, called the centrum, which helps to bear the bodies weight.
- The upper vertebrae also have a hole in the center of their centrum, which allows for the spinal cord to pass through.
- Each vertebra also has a disk of cartilage in between, which cushions the space between each centrum.
- This design allows for tiny movements in between each vertebrae, but the movements combine together to allow the body to bend and twist in many directions.
- The back one is divided into three main sections:
  - The top section, or cervical spine, contains the vertebral bones of the neck;
  - The middle section, or the thoracic section, contains the vertebral bones of the upper and middle back.

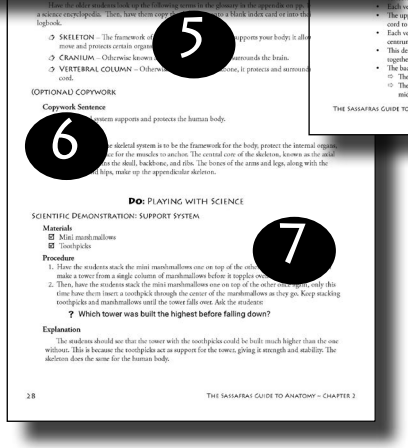
Write

4. SCIDAT Logbook Info

Have confidence that your students are grasping the key points from the reading with the information in the notebooking section. Here, you will find the scientific details that were shared in the chapter, which could be included in your students' narrations or list of facts.

5. Relevant Vocabulary

Build your students' science vocabulary with words relevant to the topics the students are studying.



Have the older students look up the following terms in the glossary in the appendix on pp. … a science encyclopedia. Then, have them copy … a blank index card or into the logbook.

- SKELETON – The framework … supports your body; it also … move and protects certain organs.
- CRANIUM – Otherwise known … surrounds the brain.
- VERTEBRAL COLUMN – Otherwise … one, it protects and surrounds … cord.

5

(Optional) Copywork

Copywork Sentence

…system supports and protects the human body.

6

…e skeletal system is to be the framework for the body, protect the internal organs, … for the muscles to anchor. The central core of the skeleton, known as the axial … the skull, backbone, and ribs. The bones of the arms and legs, along with the … hips, make up the appendicular skeleton.

Do: Playing with Science

Scientific Demonstration: Support System

Materials

☑ Mini marshmallows
☑ Toothpicks

Procedure

1. Have the students stack the mini marshmallows one on top of the other… make a tower from a single column of marshmallows before it topples over.
2. Then, have the students stack the mini marshmallows one on top of the other … this time have them insert a toothpick through the center of the marshmallows as they go. Keep stacking toothpicks and marshmallows until the tower falls over. Ask the students:

? Which tower was built the highest before falling down?

7

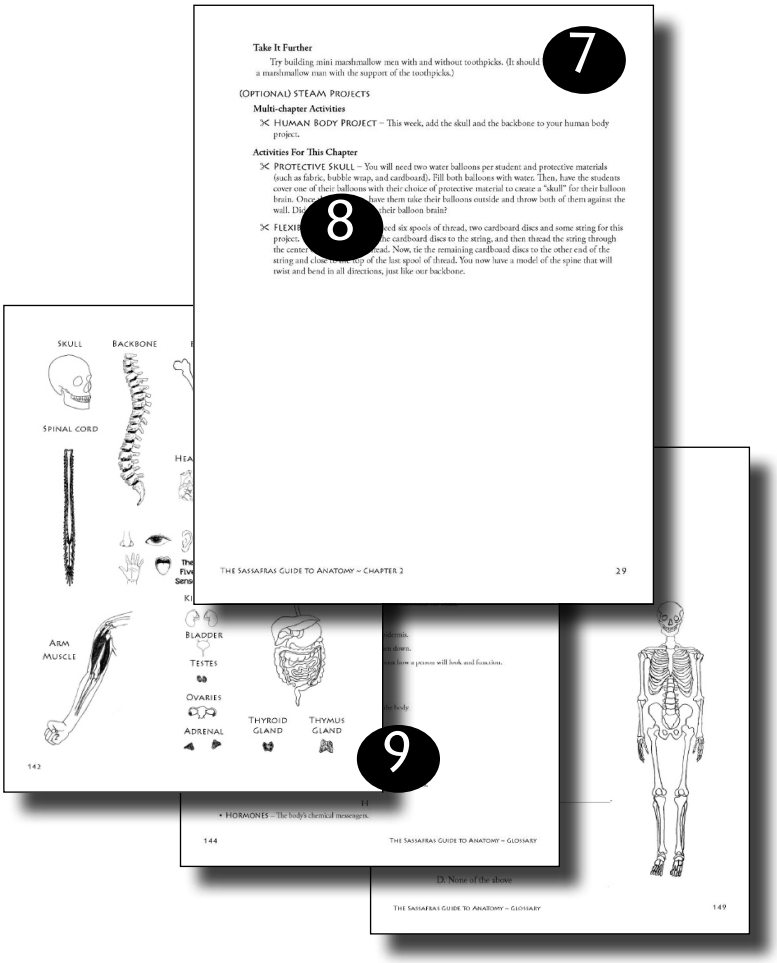
Explanation

The students should see that the tower with the toothpicks could be built much higher than the one without. This is because the toothpicks act as support for the tower, giving it strength and stability. The skeleton does the same for the human body.

6. Copywork

Use these selections as memory work, copywork, or dictation—it's up to you!

Activity Guide At-A-Glance



DO

7. Related Scientific Demonstrations

Know what materials you will need to do a weekly hands-on science activity that coordinates with the topic. This section lists the supplies you will need, provides easy-to-follow steps, and explanations to make it a snap to complete the scientific demonstration.

8. Coordinating STEAM* Activities

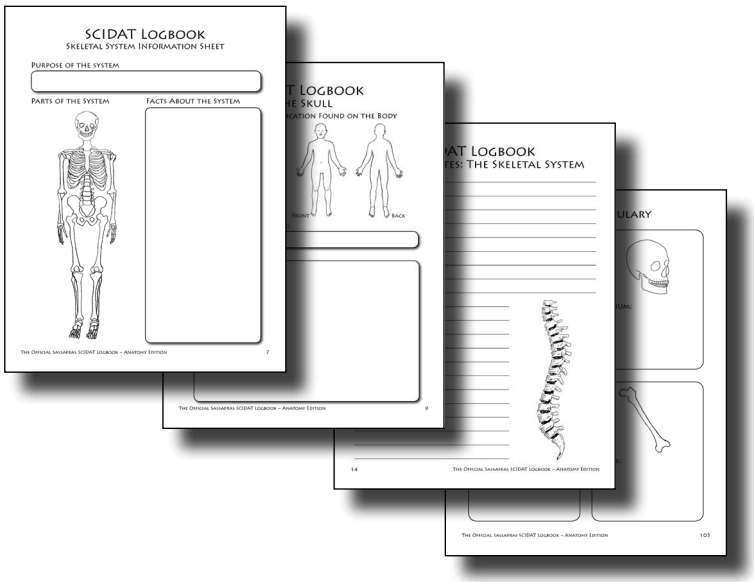
Add in a bit of STEAM with these optional activity ideas. You will find ideas for projects that last throughout the novel and ones specific to the chapter (week) you are on.

9. Templates and More

In the guide's appendix, you will find templates for the projects, a full glossary, and a set of quizzes to use along the journey.

*STEAM: Science, Technology, Engineering, Art, and Math)

The SCIDAT* Logbook



Don't forget the SCIDAT logbook for your students!!

The SCIDAT logbook will serve as a record of your students' journey! It contains all the pages the students will need as they follow like Blaine and Tracey. Each page has been attractively illustrated for you so you don't have to track down pictures for the students to use! Get it all at:

https://elementalscience.com/collections/sassafras-science

elementalscience

*SCIDAT: Scientific Data

The Sassafras Guide to Anatomy

Third Edition, First Printing

Email: support@elementalscience.com

Digital Edition

Printed In USA For worldwide distribution

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support@elementalscience.com

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Quick Start Guide

Welcome to your super, scientific journey with the Sassafras Twins!! The information and activities in this guide will help you turn a simple adventure novel into a complete science program for your elementary students. Let's start by answering three pressing questions!

What Will We Learn?

Students will learn about anatomy, which is the study of the human body. See p. 11 for a list of the topics explored in this program.

What Do I Need?

In addition to this activity guide, you will need the following materials

1. **Novel –** All the main reading assignments are from *The Sassafras Science Adventures Volume 2: Anatomy*. You can get the paperback novel, the Kindle version, or the audiobook.
2. **Student Materials –** You can have your students use a blank notebook or you can purchase *The Official Sassafras SCIDAT Logbook: Anatomy Edition* for each student. Get a glimpse of this option on p. 7. (SCIDAT stands for scientific data and it comes from the Sassafras Twins' journey.)
3. **Demonstration Supplies –** See p. 12 for a full list, or save yourself time and get the *Sassafras Science Year 1 Experiment Kit*, which includes the materials for both volume 1 and volume 2.

If you want more information thatn what is already in the novel, the following encyclopedias are scheduled in this guide:

- *Kingfisher First Encyclopedia of the Human Body* (best for grades K through 2nd)
- *DK First Human Body Encyclopedia* (best for 2nd through 4th)
- *DK Eyewitness Human Body* (best for 5th through 7th)
- *Kingfisher Science Encyclopedia* (best for 4th through 7th)

If you want to add more fun with optional STEAM* projects, you can find a list of the project supplies on p. 13.

*STEAM: Science, Technology, Engineering, Art, and Math

What Will a Week Look Like?

Each week you and your students will:

- **Read** scientific information from an adventure-filled novel, also known as a living book, and discuss what you read.
- **Write** down what the students have learned and seen in a way that is appropriate for their skills by keeping a notebook, or rather a SCIDAT Logbook.
- **Do** hands-on science through demonstrations using the directions found in this guide.

You can also add in the optional copywork, library books, and STEAM projects if you want to dig deeper into a topic. For a more detailed explanation of the components in each lesson, we highly recommend checking out the peek inside this guide on pp. 6-7 and reading the introduction on pp. 8-10. The chapter lessons begin on p. 17.

THE SASSAFRAS SCIENCE ADVENTURES

The Sassafras Guide to Anatomy
Table of Contents

The Sassafras Guide to Anatomy Introduction

Our living books method of science instruction was first proposed in *Success in Science: A Manual for Excellence in Science Education*. This approach is centered on living books that are augmented by notebooking and scientific demonstrations. The students read (or are read to) from a science-oriented living book, such as *The Sassafras Science Adventures Volume 2: Anatomy*. Then, they write about what they have learned and complete a related scientific demonstration or hands-on project. If time and interest allow, the teacher can add in non-fiction books that coordinate with the topic, do an additional activity, or memorize related information. If you want to learn more about how this works, you can listen to this free conference session on using living books for science:

- Inspiring your students to love science through living books: https://youtu.be/Dvk1LfYGONw

The books in *The Sassafras Science Adventures* series are designed to give you the tools you need to employ the living books method of science instruction with your elementary students. For this reason, we have written an activity guide and a logbook that corresponds to each novel. This particular activity guide contains 18 chapters of activities, reading assignments, scientific demonstrations, and so much more for studying anatomy.

Each of the chapters in this guide corresponds directly to the chapters in *The Sassafras Science Adventures Volume 2: Anatomy*. They were written to give you the information you need to turn the adventure novel into a full science course for your elementary students. They will provide you with a buffet of options you can use to teach the students about the human body. So pick and choose what you know you and your students will enjoy!

What Each Chapter Contains

Each chapter begins with your two scheduling options—a grid schedule and a list schedule. These contain a summary of the corresponding chapter in *The Sassafras Science Adventures Volume 2: Anatomy* and the same weekly assignments, but in a different format. These schedules are included to give you an idea of how your week could be organized, so please feel free to alter them to suit your needs. Following the scheduling options, you will find the details for reading, writing, and doing science for the particular chapter. This information is divided into the following sections:

Read: Gathering Information

- Living Book Reading Assignment – This section contains the corresponding chapter in *The Sassafras Science Adventures Volume 2: Anatomy*.

- (Optional) Encyclopedia Readings – This section contains possible reading assignments from:
  - *Kingfisher First Encyclopedia of the Human Body* (best for grades K through 2nd)
  - *DK First Human Body Encyclopedia* (best for 2nd through 4th)
  - *DK Eyewitness Human Body* (best for 5th through 7th)
  - *Kingfisher Science Encyclopedia* (best for 4th through 7th)

  You can choose to read them to the students or have the students read them on their own.

📖 (Optional) Additional Library Books – This section contains a list of books that coordinate with what is being studied in the chapter. You can check these books out of your local library.

Write: Keeping a Notebook

📋 SCIDAT Logbook Information – This section has the information that the students could have included in their SCIDAT logbooks. (SCIDAT stands for scientific data and it comes from the Sassafras Twins' journey.) The students may or may not have the same information on their logbook sheets, which is fine. You want their SCIDAT logbooks to be a record of what they have learned. The logbook information is included as a guide for you to use as you check their work. For more information about notebooking, please read the following article:

- What is notebooking? – https://elementalscience.com/blogs/news/what-is-notebooking
- How to use notebooking with different ages – https://elementalscience.com/blogs/news/notebooking-with-different-ages

✏ Vocabulary – This section includes vocabulary words that coordinate with each chapter. If the students are older, we recommend that you have them create a glossary of terms using a blank sheet of lined paper or the glossary sheets provided in *The Official Sassafras Student SCIDAT Logbook: Anatomy Edition*. You can also have them memorize these words and their definitions.

☞ (Optional) Copywork – This section contains a short copywork passage and a longer dictation passage for you to use. Some students may use the shorter passages for dictation or the longer passages for copywork. Feel free to tailor the selections to your students' abilities. You can also use the selections as memory work assignments for the students.

⌛ (Optional) Quiz – This section contains the answers for the quizzes included in the appendix. These simple, short quizzes are optional. You can use them as graded quizzes or as review sheets.

Do: Playing with Science

☑ Scientific Demonstration – This section includes a list of materials, the instructions, and an explanation for a scientific demonstration that coordinates with the chapter. There is a blank lab report sheet provided for you in the appendix on pp. 129-130 if you would like the students to do a write-up of the demonstration. If the students are in grade 4 or higher, we recommend that they complete at least one of these activities for this course.

✂ (Optional) STEAM* Projects – These sections contain additional STEAM projects and activities that correspond to the topics in the chapter. There are multi-chapter activities that students can do over the course of several chapters or over the full novel. Plus, there are activities that coordinate with each specific chapter. Pick and choose the activities that interest you and your students.

*STEAM: Science, Technology, Engineering, Art, and Math)

Additional Materials

We have provided a few additional materials in the back of this guide for your convenience. First, you will find the templates you need for the projects suggested in this guide. Next, you will find a glossary of terms, which you can use with the students as they define the words for each chapter. And finally, you will find a set of eight simple quizzes you can use with the students to verify they are retaining the material.

Quick Links

View all the links mentioned in this guide in one place and get a digital copy of the templates, glossary, and quizzes by visiting the following page:

- https://elementalscience.com/blogs/resources/volume-2-links

For the Students

The SCIDAT logbook is meant to be a record of the students' journey through their study of anatomy. It is explained in more detail in Chapter 1 of this guide. You can choose to make your own or purchase a premade logbook from Elemental Science. *The Official Sassafras SCIDAT Logbook: Anatomy Edition* has all the pages the students will need to create their own logbook. Each page has been attractively illustrated for you so you don't have to track down pictures for the students to use. This way they can focus on the information they are learning.

Final Thoughts

As the author and publisher of this curriculum I encourage you to contact me with any questions or problems that you might have concerning *The Sassafras Guide to Anatomy* at support@elementalscience.com. I, or a member of our team, will be more than happy to assist you. I hope that you and your students enjoy your journey through anatomy with the Sassafras twins!

~ Paige Hudson

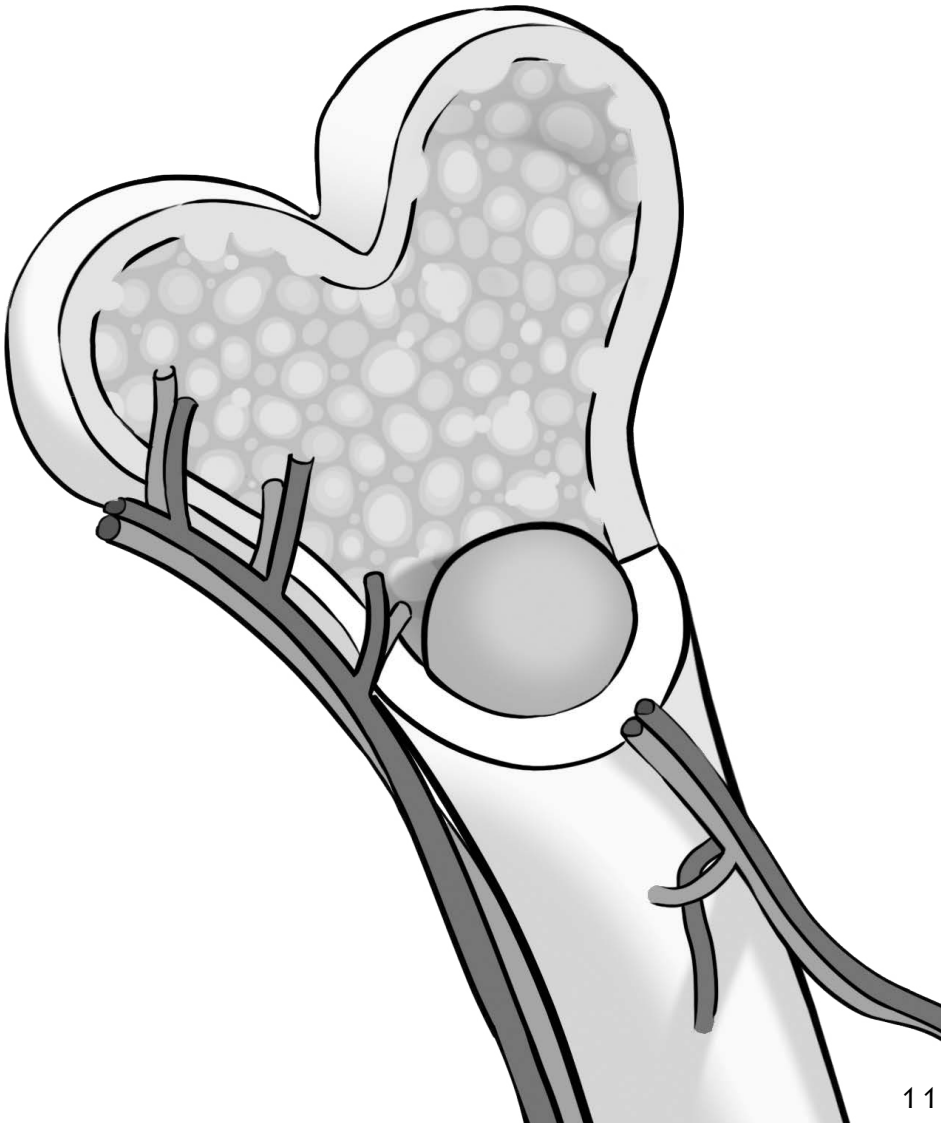
Topical List

The Sassafras Science Adventures Volume 2: Anatomy covers a variety of aspects of anatomy, such as:

- Basic Mapping Skills
- The Body Systems
    1. Skeletal
    2. Respiratory
    3. Nervous
    4. Circulatory
    5. Muscular
    6. Digestive
    7. Urinary
    8. Immune
    9. Endocrine
    10. Integumentary

In the process, you will learn about the following specific topics:

- Skull
- Spine
- Bone
- Joint
- Breathing
- Trachea
- Lungs
- Alveoli
- Brain
- Spinal Column
- The Five Senses (Touch, Sight, Taste, Smell, and Hearing)
- Blood
- Heart
- Muscles
- Teeth
- Stomach
- Intestines
- Kidney
- Bladders
- Reproduction
- DNA
- Lymph nodes
- Bacteria and Germs
- Cells
- Hormones
- Skin
- Sweat Glands
- Hair
- Fingernails



Demonstration Supplies Listed By Chapter

Chapter	Supplies Needed
1: Observation Walk	No supplies needed
2: Support System	Mini marshmallows, Toothpicks
3: Rubber Bones	2 Raw chicken bones, Gloves, 2 Plastic bags, Vinegar
4: Out of Breath	Watch with a second hand
5: Bottle Lungs	Small plastic bottle, 2 Balloons – one large, one small, Straw, Rubber band, Scissors, Tape, Modeling clay
6: Testing reflexes	Book, Wire screen, Cotton ball
7: Blind Taste Test	Several types of food, Several paper plates, Blindfold
8: Heartbeat	Stethoscope or paper towel tube
9: How Strong Am I?	Objects of varying weights, Scale
10: Falling Food	Several slices of bread (or other non-choking hazard food that the students can eat and enjoy)
11: Kidney Filtration	Red and gold glitter, 1 Mini-marshmallow, Corn Syrup, Yellow food coloring, Water, Large bowl, Large jar, Coffee filter or cheesecloth, Colander
12: Picture Family Tree	Pictures of your family up to grandparents
13: Spreading Germs	Several friends, Several different colors of glitter
14: Cell Membrane	Balloon, Eye dropper, Cotton ball, Mint (or Vanilla) Extract, Large box with a lid and no holes
15: Adrenaline Rush	Two types of music – one very slow, one fast
16: Seeing Skin	Food coloring, Magnifying glass
17: How Strong is Hair?	Pennies (10-30), Piece of hair (at least 5 inches long), Several heavy books, Pencil, Tape
18: Pick-up Bones	Pick-up Bones Cards (Download for free from Elemental Science)

STEAM Project Supplies Listed By Chapter

The multi-chapter and specific chapter STEAM projects listed in this guide are optional, so you may not need all of these supplies. However, this list has been provided for your convenience. If you do decide to do these projects, in addition to the items listed each week you will need glue, scissors, a variety of paint colors, and a set of markers.

Chapter	Supplies Needed
1	Butcher paper
2	Water balloons, Protective materials (such as fabric, bubble wrap, or cardboard), 6 Spools of thread, Cardboard, String
3	Brad, Cardstock, Hole punch, Microscope slide of bone tissue
4	Mirror, Cotton balls, Straws
5	Plastic wrap, 2 Straws, Spray oil, Microscope slide of lung tissue
6	Different colors of modeling clay, Sheep's brain dissection kit, Microscope slide of brain cells
7	Balloons, Beans, Rice, Salt, Clay, Sheep's eye dissection kit
8	Sheep's heart dissection kit, Microscope slide with red blood cells
9	Long cardboard tube, Rubber band, String, 2 Long balloons, Microscope slide of muscle cells
10	Large Ziploc bag, Bread, Coke, Microscope slide of the salivary gland
11	Balloon, Funnel, Water, Sheep's kidney dissection kit
12	Different colors of LEGO blocks
13	Several magazines, Poster board
14	Jell-O, Grape, Materials for organelles
15	Puzzle pieces, Microscope slide of epithelial cells
16	Paper, Magnifying glass, Stamp ink, Microscope image of skin cells
17	Paper, Several students, Microscope slide, Piece of hair
18	Notebook

Microscope and Dissection Supplies

In this activity guide I have suggested several dissection and microscope activities. These are optional and they are best utilized with older students. For the microscope work, I have included links to view the slides online, so purchasing a microscope is not absolutely necessary for this course. I have shared the information below about purchasing these supplies for your convenience.

Microscope Information

If you do not already own a microscope and you have the funds to get one, I suggest purchasing one for this course. You can purchase a good quality microscope at:

- Lab Essentials, Inc (www.labessentials.com)
- Children's microscopes (www.childrensmicroscopes.com/022a000m.html)
- Home School Science Tools (www.hometrainingtools.com)

When purchasing a microscope, you are looking for the following things:

- ☑ A compound monocular microscope
- ☑ A microscope with 4x, 10x, and 40x objective lenses at a minimum (NOTE—The eyepiece should also give 10x magnification, which then will allow you to look at an object at 40x, 100x, and 400x magnification.)
- ☑ A microscope with separate coarse and fine adjustment knobs
- ☑ A good light source (NOTE—The best light source is a fluorescent bulb. Do not get one with mirror illumination.)

When choosing a slide set for this course, I recommend the Anatomy slide set from Home Science Tools as it contains all the slides suggested in this activity guide.

- http://www.hometrainingtools.com/anatomy-slide-set/p/MS-SETANA/

If you don't know how to use a microscope, see this website for directions:

- http://www.microscope-microscope.org/basic/how-to-use-a-microscope.htm

Dissection Information

There are four dissections suggested in this guide—the brain, the eye, the heart and the kidney. You can purchase a kit with all four of these organs from:

- Carolina Biological: http://www.carolina.com/mammal-organ-dissection-kits/comparative-sheep-organ-dissection-kit/227970.pr?catId=10776&mCat=10748&sCat=10772&ssCat=&question=
- Home Science Tools: http://www.hometrainingtools.com/mammal-organs-dissection-kit/p/DE-ORGANS/

The Sassafras Guide to the Characters Found in Volume 2: Anatomy

Throughout the Book

(Note—These characters also appeared in *The Sassafras Science Adventures Volume 1: Zoology*.)

- **Blaine Sassafras:** The boy Sassafras twin, also known as Train. He started the summer hating science, but is now starting to change his mind.
- **Tracey Sassafras:** The girl Sassafras twin, also known as Blaisey. She started the summer hating science, but is now starting to change her mind.
- **Uncle Cecil:** The Sassafras twins' crazy, forgetful, and messy uncle. He is the scientist behind the invisible zip lines.
- **President Lincoln:** Uncle Cecil's lab assistant, who also happens to be a prairie dog. He is also the co-inventor of the zip lines.
- **The Man With No Eyebrows:** He has no eyebrows and an extreme dislike for Uncle Cecil. Not only is he spying on the red-haired scientist, but he is also trying to sabotage the twins at every stop.

Addis Ababa, Ethiopia (Chapters 2-3)

- **Larry 'Snowflake' Maru:** (mah-roo) The local expert for the Ethiopian leg of the twins' anatomy adventures. He dabbles in archaeology and is very knowledgeable about the skeletal system.
- **Raz:** He is Snowflake's best friend and owner of Raz's Pawn & Antiques shop.
- **Retta:** She is Raz's wife and co-owner of the Raz & Retta's coffee shop.
- **Brother Eskinder:** He is the Ethiopian custodial priest of the Holy Trinity Cathedral.

Sydney, Australia (Chapters 4-5)

- **Julie Ette:** The local expert for the Australian leg of the twins' anatomy adventures. She is an amazing singer participating in the singing portion of the Take Your Breath Away competition.
- **Suzy McSnazz:** She is one of the finalists in the singing portion of the Take Your Breath Away competition.
- **Colorado Quadruplets (aka Ladder Smash):** Denver, Dexter, Denise, and Dolores make up this act, which is one of the finalists in the dancing portion of the Take Your Breath Away competition.
- **Trudy Stiles:** She is one of the finalists in the dancing portion of the Take Your Breath Away competition.
- **Flip Pippen:** He and his puppet, Zippy, are finalists in the magic portion of the Take Your Breath Away competition.
- **The Dark Cape:** He is one of the finalists in the magic portion of the Take Your Breath Away competition.
- **Bob Squats:** He is one of the finalists in the miscellaneous portion of the Take Your Breath Away competition.
- **Cletus Magnolia:** He is one of the finalists in the miscellaneous portion of the Take Your Breath Away competition.
- **Dean Bean, Jr.:** The announcer for the Take Your Breath Away competition.
- **Victoria Valencia, Bobbie Mega, Miles Dockerty:** The judges for the Take Your Breath Away competition.

Venice, Italy (Chapters 6-7)

- **Vittorio Benaneli:** (vee-tor-ee-o ben-ah-neh-lee) The local expert for the Italian leg of the twins' anatomy adventures. He is an expert chef and owner of Benaneli's restaurant.

- ✯ **Giovanni:** (gee-o-van-ee) He is Vittorio's nephew and dishwasher at Benaneli's.
- ✯ **Salvatore & Bruno:** They are Vittorio's competition seeking to put him out of business by learning his secret ingredient.
- ✯ **Mama Benaneli:** She is Vittorio's mother, Giovanni's grandmother, and keeper of the secret ingredient.

Beijing, China (Chapters 8-9)

- ✯ **Coach Boxton:** The local expert for the Chinese leg of the twins' anatomy adventures. He is also the American coach of China's Olympic decathlete team.
- ✯ **Jek:** He is Coach Boxton's assistant and translator.
- ✯ **Dr. Veeginburger:** He is a pharmaceutical salesman who tries to sell Coach Boxton illegal supplements.
- ✯ **Itsy:** He is Dr. Veeginburger's muscle and proof that the supplements work.
- ✯ **The Ancient Calligrapher:** He is a legendary old man who secretly lives in the Great Wall of China. He is said to possess great wisdom but will only answer one question.

Lubbock, Texas (Chapters 10-11)

- ✯ **Burly Scav:** The local expert for the Texan leg of the twins' anatomy adventures. He is a local trash man and inventor of the Smart Dump.
- ✯ **Trevor Scav:** He is the teenage son of Burly Scav.
- ✯ **Kimlee Broadstine:** She is an investor from the Broadstine Investment Group and the daughter of Broderick Broadstine. She unwillingly reviews the Smart Dump project for potential investors.
- ✯ **Smirk & Chili:** They are two of the meanest, nastiest, but coolest kids from Trevor's school.

Bangkok, Thailand (Chapters 12-13)

- ✯ **Dr. Olivia Apple:** The local expert for the Thai leg of the twins' anatomy adventures. She is the director of the woman's center in a local hospital.
- ✯ **Nart:** (nah-rr-t) He is the accident prone Thai man who is always hanging around Dr. Apple's hospital.
- ✯ **Chanarong:** (ch-ahn-rr-ong) He is an officer in the Thai military and friend of Dr. Apple.
- ✯ **Lawana:** (lah-wah-nah) She is the pregnant friend of Dr. Apple. She has been kidnapped. Her husband, Mongkut, died in a construction accident.
- ✯ **Kingman Nawarak:** (nah-wah-rr-k) He is an evil man who tries to control Bangkok through cheating and kidnapping.

Alaska (Chapters 14-15)

(Note—These characters also appeared in *The Sassafras Science Adventures Volume 1: Zoology*.)

- ✯ **Summer Beach:** The local expert for the Alaskan leg of the twins' anatomy adventures. She was also a former classmate of Uncle Cecil's and has a bit of a crush on him.
- ✯ **Ulysses S. Grant:** Summer Beach's lab assistant, who also happens to be an arctic ground squirrel and inventor extraordinaire.

Dubai, UAE (Chapters 16-17)

- ✯ **Sylvester 'Doc' Hibbel:** The local expert for the Dubai leg of the twins' anatomy adventures. He is a traveling salesman and inventor of several medicinal elixirs.
- ✯ **Sheikh Rehan:** He is a billionaire oil baron and a big fan of cowboy culture as well as horse racing.
- ✯ **Arnie Derbinhoogan:** He and his horse, Horsinhoogan, are contestants in The Wind Tower 100 race.
- ✯ **Najib:** He and his horse, Yazer, are contestants in The Wind Tower 100 race.
- ✯ **Itja:** (eet-jah) The scoundrel leader of a group of bandits, known as the Kekeway (Kee-kee-way). He also appeared in *The Sassafras Science Adventures Volume 1: Zoology*.

Chapter Lessons

Chapter 1: Grid Schedule

Supplies Needed	
Demo	• No Supplies Needed
Projects	• Butcher paper

Chapter Summary

Blaine and Tracey Sassafras wake up to the smell of breakfast cooking at Uncle Cecil's. As they enter the kitchen they are treated to a delicious feast, courtesy of President Lincoln's latest invention. After eating, they go downstairs to recap their zoology adventure and learn more about what is coming up. The twins learn that they will be studying anatomy, which is all about the human body. They meet Socrates and Aristotle, a pair of plastic skeletons in their Uncle Cecil's basement, and find out that their first location will be in Ethiopia. At the end of this chapter, we also learn that the Man With No Eyebrows has his own set of invisible zip lines which is how he has been able to follow the twins throughout their journey.

Weekly Schedule

	Day 1	Day 2	Day 3	Day 4
Read	☐ Read the section entitled "Breakfast at Cecil's" of Chapter 1 in *SSA* Volume 2: Anatomy.*	☐ (*Optional*) Read one or all of the assigned pages from the encyclopedia of your choice.	☐ Read the section entitled "Socrates and Aristotle" of Chapter 1 in *SSA Volume 2: Anatomy.*	☐ (*Optional*) Read one of the additional library books.
Write	☐ Set up the students' SCIDAT logbooks.	☐ Write observations learned form the demonstration on SL p. 5. ☐ (*Optional*) Write a narration on the Anatomy Notes Sheet on SL p. 6.		☐ (*Optional*) Complete the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 6.
Do		☐ Do the demonstration entitled "Observation Walk".		☐ (*Optional*) Play a game of "I Spy."

**SSA = The Sassafras Science Adventures*
***SL = The Official Sassafras SCIDAT Logbook: Anatomy Edition*

Chapter 1: List schedule

Chapter Summary

Blaine and Tracey Sassafras wake up to the smell of breakfast cooking at Uncle Cecil's. As they enter the kitchen they are treated to a delicious feast, courtesy of President Lincoln's latest invention. After eating, they go downstairs to recap their zoology adventure and learn more about what is coming up. The twins learn that they will be studying anatomy, which is all about the human body. They meet Socrates and Aristotle, a pair of plastic skeletons in their Uncle Cecil's basement, and find out that their first location will be in Ethiopia. At the end of this chapter, we also learn that the Man With No Eyebrows has his own set of invisible zip lines which is how he has been able to follow the twins throughout their journey.

Essentials

Read

- ☐ Read the section entitled "Breakfast at Cecil's" of Chapter 1 in *SSA* Volume 2: Anatomy.*
- ☐ Read the section entitled "Socrates and Aristotle" of Chapter 1 in *SSA Volume 2: Anatomy.*

Write

- ☐ Set up the students' SCIDAT logbooks.
- ☐ Write observations learned from the demonstration on SL p. 5.

Do

- ☐ Do the demonstration entitled "Observation Walk".

(Optional) Extras

Read

- ☐ Read one of the additional library books.
- ☐ Read one or all of the assigned pages from the encyclopedia of your choice.

Write

- ☐ Write a narration on the Anatomy Notes Sheet on SL p. 6.
- ☐ Complete the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 6.

Do

- ☐ Play a game of "I Spy."

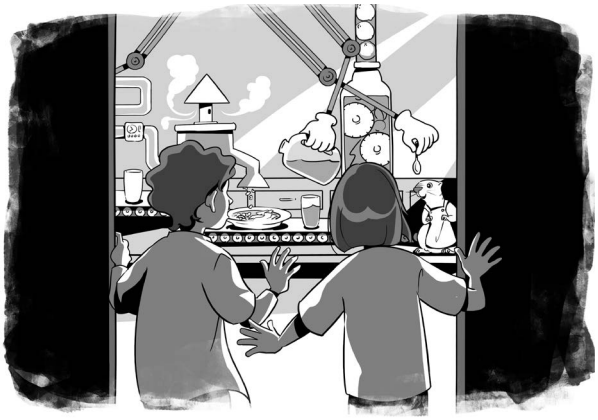
Supplies Needed	
Demo	• No Supplies Needed
Projects	• No Additional Supplies Needed

**SSA = The Sassafras Science Adventures*
***SL = The Official Sassafras SCIDAT Logbook: Anatomy Edition*

Chapter 1: Adventures in Anatomy

Read: Gathering Information

Living Book Reading Assignment



- 🕮 Chapter 1 of *The Sassafras Science Adventures Volume 2: Anatomy*

(Optional) Encyclopedia Readings

- *The Kingfisher First Encyclopedia of the Human Body* pp. 10-11 (Our Bodies)
- *DK First Human Body Encyclopedia* pp. 4-5 (Your Amazing Body)
- *DK Eyewitness Human Body* pp. 6-7 (The Human Body)
- *The Kingfisher Science Encyclopedia* pp. 98-99 (Body Organization)

(Optional) Additional Library Books

- 🕮 *Inside Your Outside: All About the Human Body (Cat in the Hat's Learning Library)* by Tish Rabe and Aristides Ruiz
- 🕮 *Me and My Amazing Body* by Joan Sweeney and Annette Cable
- 🕮 *The Magic School Bus Inside the Human Body* by Joanna Cole and Bruce Degen

Write: Keeping a Notebook

SCIDAT Logbook Sheets

This week, you will set up the students' SCIDAT logbook. You can use blank sheets of copy paper with dividers for each section or purchase *The Official Sassafras Student SCIDAT Logbook: Anatomy Edition* with all the pages and pictures from Elemental Science. For each of these sheets you can have the students enter information only from *The Sassafras Science Adventures Volume 2: Anatomy*, or you can have them do additional research to gather more facts. The following video shares a peek inside a 2nd-grader's SCIDAT Logbook:

🖱 https://www.youtube.com/watch?v=0m4nj-K7s58

What you choose to do will depend upon the ages and abilities of your students. Below is an explanation of each of the student sheets.

Body System Information Sheets

The purpose of these sheets is for the students to record what they have learned about the various body systems studied in The Sassafras Science Adventures Volume 2: Anatomy.

Purpose of the system: The students will enter the main purpose of the body system that is being studied.

Parts of the System: Have the students label the various parts of the system that they have

studied. If you have older students, you can have them label the additional parts of the system from their encyclopedia assignments.

Facts about the System: The students should record the facts they have learned about the body system.

Around the World Sheets

The purpose of these sheets is to give the students an opportunity to work on their mapping skills.

Map: The students will color and label the places on the world map to which the twins have traveled.

Facts About: Have the students enter any interesting information they have learned about the area, such as climate, general appearance, or historical facts.

Anatomy Record Sheets

The purpose of these sheets is for the students to record what they have learned about the various body parts and processes that are introduced in *The Sassafras Science Adventures Volume 2: Anatomy*.

Location Found on the Body: The students should circle or color in the place on the body where the part or process can be found.

The _____ is a Part of the: Have the students record the body system with which the part or process is associated.

Information Learned: The students should enter any information that they have learned about the body part or process.

Anatomy Notes Sheets

The purpose of these sheets is for the students to record any additional information that they have learned during their study of anatomy. You can use these sheets to record additional narrations, copywork, or dictation assignments.

Project Record Sheets

The purpose of these sheets is for the students to record the STEAM projects they have done through the course of their study of anatomy.

Anatomy Glossary

The purpose of the glossary is for the students to create a dictionary of terms that they have encountered throughout reading *The Sassafras Science Adventures Volume 2: Anatomy*. They can look each of the terms up in a science encyclopedia or in the glossary included on pp. 143-145 of this guide. The students should illustrate each of the vocabulary words. (Note—In *The Official Sassafras Student SCIDAT Logbook: Anatomy Edition* these pictures are already provided.)

(Optional) Copywork

Copywork Selection

Observation is taking the time to look at the things around me.

Dictation Passage: (*poem selection by Henry Wadsworth Longfellow*)

And he wandered away and away,

With Nature the dear old nurse,
Who sang to him night and day,
The rhymes of the universe.

And when the way seemed long,
and his heart began to fail,
She sang a more wonderful song,
or told a more wonderful tale.

Do: Playing with Science

Scientific Demonstration: Observation Walk

Begin by taking a moment to discuss what nature study is and the importance of observation in science. You can view the following blog posts for more information on the subject.

- https://elementalscience.com/blogs/podcast/episode-8
- http://elementalscience.com/blogs/news/63858627-observation-is-key

Explain that today you are going to practice your observation skills while on a walk. Then, take a walk in your neighborhood or on a nature trail nearby where you live. Allow the students to make observations and ask questions. Ask the students:

- **?** What kinds of plants do you see?
- **?** What kinds of animals do you see?
- **?** What kinds of people do you see?
- **?** What else do you see that you would like to tell me about?

(Optional) STEAM Projects

Multi-chapter Activities

✂ Human Body Project – For this project you will create a life size poster of the students' bodies and add the parts as you study them. This week, have each of the students lay down on a length of butcher paper and trace their body. Then, as you study a part, have the students draw and color in the particular part or glue on a pre-printed version. They can also label each part and include one thing that it does. (Note—If you do not wish to do a life-sized version of this project, I have included a wall-sized version in the appendix of this guide on pp. 138-139. I have also included pictures of the body parts in the appendix of this guide on p. 140 for you to use with the wall-sized version. You could also blow these pictures up to use with the life-sized version.)

Activities For This Chapter

✂ I Spy – Play a game of "I Spy" to help the students work on their observation skills.

Chapter 2: Grid Schedule

Supplies Needed	
Demo	• Mini marshmallows, Toothpicks
Projects	• Water balloons, Protective materials (fabric, bubble wrap, or cardboard), 6 Spools of thread, Cardboard, String

Chapter Summary

The chapter opens with Blaine and Tracey landing on an awning in Addis Ababa, where they find a backpack. They soon fall through the awing into the marketplace below. A chase ensues and the twins seek refuge in a shop that looks like it is closed. They soon find out that they are not alone. They overhear a conversation between a man named Raz and their local expert, Larry "Snowflake" Maru, about a mysterious skull before they are discovered. When Snowflake sees the backpack they found, he gets excited and invites the twins to join him at Raz's coffee shop. It is there that the twins first learn about the backbone and the Legend of the Seven Monks Tomb and how the backpack fits into it. The chapter ends with the discovery that the Man With No Eyebrows has also followed the twins to Ethiopia.

Weekly Schedule

	Day 1	Day 2	Day 3	Day 4
Read	☐ Read the section entitled "The Surprising Skull" of Chapter 2 in *SSA Volume 2: Anatomy.*	☐ Read the section entitled "Stories and Spines" of Chapter 2 in *SSA Volume 2: Anatomy.*	☐ (*Optional*) Read one or all of the assigned pages from the encyclopedia of your choice.	☐ (*Optional*) Read one of the additional library books.
Write	☐ Fill out an Anatomy Record Sheet on SL p. 9 for the skull. ☐ Go over the vocabulary words and enter them into the Anatomy Glossary on SL p. 105.	☐ Fill out an Anatomy Record Sheet on SL p. 10 for the backbone. ☐ Fill out the Body Systems Sheet on SL p. 7 for the skeletal system.	☐ Write information learned from the demonstration on SL p. 13. ☐ (*Optional*) Write a narration on the Anatomy Notes Sheet on SL p. 13.	☐ (*Optional*) Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 13. ☐ (*Optional*) Complete the Around the World sheet for Ethiopia on SL p. 8.
Do	☐ (*Optional*) Make and Test a Protective Skull.	☐ (*Optional*) Make a Flexible Spine.	☐ Do the demonstration entitled "Support System".	☐ (*Optional*) Add to the Human Body Project.

Chapter 2: List schedule

Chapter Summary

The chapter opens with Blaine and Tracey landing on an awning in Addis Ababa, where they find a backpack. They soon fall through the awing into the marketplace below. A chase ensues and the twins seek refuge in a shop that looks like it is closed. They soon find out that they are not alone. They overhear a conversation between a man named Raz and their local expert, Larry "Snowflake" Maru, about a mysterious skull before they are discovered. When Snowflake sees the backpack they found, he gets excited and invites the twins to join him at Raz's coffee shop. It is there that the twins first learn about the backbone and the Legend of the Seven Monks Tomb and how the backpack fits into it. The chapter ends with the discovery that the Man With No Eyebrows has also followed the twins to Ethiopia.

Essentials

Read

- ☐ Read the section entitled "The Surprising Skull" of Chapter 2 in *SSA Volume 2: Anatomy.*
- ☐ Read the section entitled "Stories and Spines" of Chapter 2 in *SSA Volume 2: Anatomy.*

Write

- ☐ Fill out an Anatomy Record Sheet on SL p. 9 for the skull.
- ☐ Go over the vocabulary words and enter them into the Anatomy Glossary on SL p. 105.
- ☐ Fill out an Anatomy Record Sheet on SL p. 10 for the backbone.
- ☐ Fill out the Body Systems Sheet on SL p. 7 for the skeletal system.
- ☐ Write information learned from the demonstration on SL p. 13.

Do

- ☐ Do the demonstration entitled "Support System".

(Optional) Extras

Read

- ☐ Read one of the additional library books.
- ☐ Read one or all of the assigned pages from the encyclopedia of your choice.

Write

- ☐ Write a narration on the Anatomy Notes Sheet on SL p. 13.
- ☐ Complete the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 13.
- ☐ Complete the Around the World sheet for Ethiopia on SL p. 8.

Do

- ☐ Make and Test a Protective Skull.
- ☐ Make a Flexible Spine.
- ☐ Add to the Human Body Project.

Supplies Needed	
Demo	• Mini marshmallows, Toothpicks
Projects	• Water balloons, Protective materials (fabric, bubble wrap, or cardboard), 6 Spools of thread, Cardboard, String

Chapter 2: Ethiopia, Here We Come!

Read: Gathering Information

Living Book Reading Assignment

📖 Chapter 2 of *The Sassafras Science Adventures Volume 2: Anatomy*

(Optional) Encyclopedia Readings

- *The Kingfisher First Encyclopedia of the Human Body* pp. 20-21 (Bony Frame), pp. 22-23 (The Skull)
- *DK First Human Body Encyclopedia* pp. 14-15 (Head Case), pp. 16-17 (Bendable Backbone)
- *DK Eyewitness Human Body* pp. 16-17 (The Body's Framework)
- *The Kingfisher Science Encyclopedia* pp. 102-103 (The Skeleton)

(Optional) Additional Library Books

📖 *The Skeleton Inside You (Let's-Read-and-Find... Science 2)* by Philip Balestrino and True Kelley
📖 *I Spy A Skeleton (Scholastic Reader Level 1)* by Jean Marzollo and Walter Wick
📖 *Scholastic Reader Level 2: Skeletons* by Lily Wood

Write: Keeping a Notebook

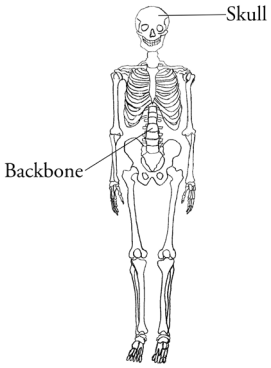
SCIDAT Logbook Sheets

This week, you can have the students begin to fill out a Body System Information Sheet for the Skeletal System, an Around the World Sheet for Ethiopia, and a logbook page for skull and backbone. The students could include the following information:

Body System Information Sheet - The Skeletal System

Purpose of the system: To be the framework for the body, to protect the important organs and anchor muscles.

Parts of the System: Have the students label the skull and backbone.



Facts about the System

- The skeletal system includes the bones and tissues that connect them (such as tendons, ligaments, and cartilage).
- The skeleton contains two hundred six bones that support the body.
- It is strong, yet flexible; the skeleton protects important organs and anchors muscles.
- Without the skeleton, our body would be a floppy mess.
- The central core of the skeleton, or the axial skeleton, contains the skull, backbone, and ribs.

Around the World - Ethiopia

Map: Have the students locate Ethiopia on the map and label it. Then, have them find Addis Ababa and draw a star where it is located in Ethiopia.

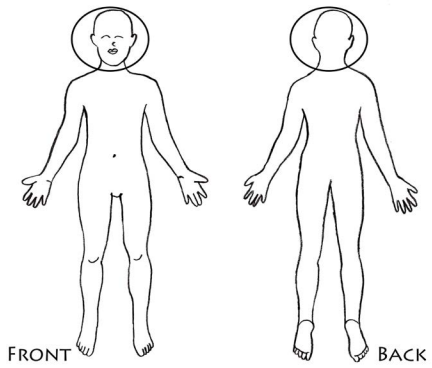
Facts About: Enter any interesting information the students have learned about the area, such as climate, general appearance, or historical facts. The students could add information about the open air markets in Addis Ababa.

Anatomy Record Sheet - Skull

Body Part: The Skull

The Skull is a Part of the: Skeletal System

Location Found on the Body



Information Learned

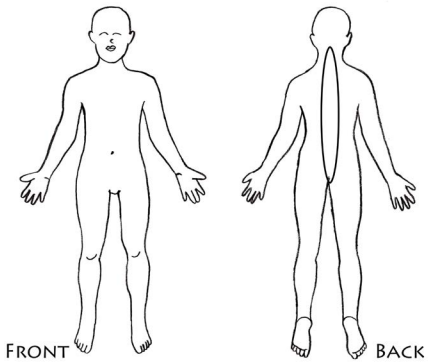
- The skull has twenty-two bones; eight form the cranium, which is the dome-shaped bony box that surrounds the brain; the other fourteen bones of the skull make up the facial structures.
- It also protects the brain from being smashed or damaged.
- Only the lower jaw is able to move freely.
- The bones of the skull meet at jagged edges that line up and lock tightly together like a puzzle, which gives the skull its strength.
- The skull has openings for the ears, nose, and mouth.
- The eye sockets allow the eyes to move freely, but also provide them with a protective pocket.
- There are two rows of teeth anchored into the upper and lower jawbones of the skull.

Anatomy Record Sheet - Backbone

Body Part: The Backbone

The Backbone is a Part of the: Skeletal System

Location Found on the Body



Information Learned

- The backbone, or spine, provides a protective tunnel for the spinal cord.
- It stretches from the base of the skull to the bottom of the pelvis.
- It is a strong and flexible rod that helps to keep the body upright.
- The spine consists of thirty-three vertebrae with the lower five being fused together.
- Each vertebra has a central portion, called the centrum, which helps to bear the bodies weight.
- The upper vertebrae also have a hole in the center of their centrum, which allows for the spinal cord to pass through.
- Each vertebra also has a disk of cartilage in between, which cushions the space between each centrum.
- This design allows for tiny movements in between each vertebrae, but the movements combine together to allow the body to bend and twist in many directions.
- The back one is divided into three main sections:
  - ⇨ The top section, or cervical spine, contains the vertebral bones of the neck;
  - ⇨ The middle section, or the thoracic section, contains the vertebral bones of the upper and middle back.

⇨ The lower section, or the lumbar section, contains the vertebral bones of the lower back, including the five fused bones of the sacrum.

Vocabulary

Have the older students look up the following terms in the glossary in the appendix on pp. 143-145 or in a science encyclopedia. Then, have them copy the definition onto a blank index card or into their SCIDAT logbook.

- Skeleton – The framework of two hundred six bones that supports your body; it allows you to move and protects certain organs.
- Cranium – Otherwise known as the skull, it protects and surrounds the brain.
- Vertebral column – Otherwise known as the backbone, it protects and surrounds the spinal cord.

(Optional) Copywork

Copywork Sentence

The skeletal system supports and protects the human body.

Dictation Selection

The purpose of the skeletal system is to be the framework for the body, protect the internal organs, and provide a place for the muscles to anchor. The central core of the skeleton, known as the axial skeleton, contains the skull, backbone, and ribs. The bones of the arms and legs, along with the shoulders and hips, make up the appendicular skeleton.

Do: Playing with Science

Scientific Demonstration: Support System

Materials

- ☑ Mini marshmallows
- ☑ Toothpicks

Procedure

1. Have the students stack the mini marshmallows one on top of the other to see how high they can make a tower from a single column of marshmallows before it topples over.
2. Then, have the students stack the mini marshmallows one on top of the other once again, only this time have them insert a toothpick through the center of the marshmallows as they go. Keep stacking toothpicks and marshmallows until the tower falls over. Ask the students:

   ? Which tower was built the highest before falling down?

Explanation

The students should see that the tower with the toothpicks could be built much higher than the one without. This is because the toothpicks act as support for the tower, giving it strength and stability. The skeleton does the same for the human body.

Take It Further

Try building mini marshmallow men with and without toothpicks. (It should be much easier to build a marshmallow man with the support of the toothpicks.)

(Optional) STEAM Projects

Multi-chapter Activities

✂ Human Body Project – This week, add the skull and the backbone to the human body project.

Activities For This Chapter

✂ Protective Skull – You will need two water balloons per student and protective materials (such as fabric, bubble wrap, and cardboard). Fill both balloons with water. Then, have the students cover one of their balloons with their choice of protective material to create a "skull" for their balloon brain. Once they are done, have them take their balloons outside and throw both of them against the wall. Did their "skull" protect their balloon brain?

✂ Flexible Spine – You will need six spools of thread, two cardboard discs and some string for this project. Tie one end of one of the cardboard discs to the string, and then thread the string through the center of the spools of thread. Now, tie the remaining cardboard discs to the other end of the string and close to the top of the last spool of thread. You now have a model of the spine that will twist and bend in all directions, just like our backbone.

Chapter 3: Grid Schedule

Supplies Needed	
Demo	• 2 Raw chicken bones, Gloves, 2 Plastic bags, Vinegar
Projects	• Brad, Cardstock, Scissors, Hole punch, Microscope slide of bone tissue

Chapter Summary

The chapter opens with Blaine and Tracey landing on an awning in Addis Ababa, where they find a backpack. They soon fall through the awing into the marketplace below. A chase ensues and the twins seek refuge in a shop that looks like it is closed. They soon find out that they are not alone. They overhear a conversation between a man named Raz and their local expert, Larry "Snowflake" Maru, about a mysterious skull before they are discovered. When Snowflake sees the backpack they found, he gets excited and invites the twins to join him at Raz's coffee shop. It is there that the twins first learn about the backbone and the Legend of the Seven Monks Tomb and how the backpack fits into it. The chapter ends with the discovery that the Man With No Eyebrows has also followed the twins to Ethiopia.

Weekly Schedule

	Day 1	Day 2	Day 3	Day 4
Read	☐ Read the section entitled "Blocks and Bones" of Chapter 3 in *SSA Volume 2: Anatomy.*	☐ Read the section entitled "Jumping Joints" of Chapter 3 in *SSA Volume 2: Anatomy.*	☐ (*Optional*) Read one or all of the assigned pages from the encyclopedia of your choice.	☐ (*Optional*) Read one of the additional library books.
Write	☐ Fill out an Anatomy Record Sheet on SL p. 11 for the bones. ☐ Go over the vocabulary words and enter them into the Anatomy Glossary on SL pp. 105-106.	☐ Fill out an Anatomy Record Sheet on SL p. 12 for the joints. ☐ Fill out the Body Systems Sheet on SL p. 7 for the skeletal system.	☐ Write information learned from the demonstration on SL p. 14. ☐ (*Optional*) Write a narration on the Anatomy Notes Sheet on SL p. 14.	☐ (*Optional*) Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 14. ☐ (*Optional*) Take Anatomy Quiz #1.
Do	☐ (*Optional*) Make a Calcium Record. ☐ *Optional*) Do Microscope Work.	☐ (*Optional*) Make your own Joints.	☐ Do the demonstration entitled "Rubber Bones".	☐ (*Optional*) Add to the Human Body Project.

Chapter 3: List schedule

Chapter Summary

The chapter opens with Blaine and Tracey landing on an awning in Addis Ababa, where they find a backpack. They soon fall through the awing into the marketplace below. A chase ensues and the twins seek refuge in a shop that looks like it is closed. They soon find out that they are not alone. They overhear a conversation between a man named Raz and their local expert, Larry "Snowflake" Maru, about a mysterious skull before they are discovered. When Snowflake sees the backpack they found, he gets excited and invites the twins to join him at Raz's coffee shop. It is there that the twins first learn about the backbone and the Legend of the Seven Monks Tomb and how the backpack fits into it. The chapter ends with the discovery that the Man With No Eyebrows has also followed the twins to Ethiopia.

Essentials

Read

- ☐ Read the section entitled "Blocks and Bones" of Chapter 3 in *SSA Volume 2: Anatomy.*
- ☐ Read the section entitled "Jumping Joints" of Chapter 3 in *SSA Volume 2: Anatomy.*

Write

- ☐ Fill out an Anatomy Record Sheet on SL p. 11 for the bones.
- ☐ Go over the vocabulary words and enter them into the Anatomy Glossary on SL pp. 105-106.
- ☐ Fill out an Anatomy Record Sheet on SL p. 12 for the joints.
- ☐ Fill out the Body Systems Sheet on SL p. 7 for the skeletal system.
- ☐ Write information learned from the demonstration on SL p. 14.

Do

- ☐ Do the demonstration entitled "Rubber Bones".

(Optional) Extras

Read

- ☐ Read one of the additional library books.
- ☐ Read one or all of the assigned pages from the encyclopedia of your choice.

Write

- ☐ Write a narration on the Anatomy Notes Sheet on SL p. 14.
- ☐ Complete the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL p. 14.
- ☐ Take Anatomy Quiz #1.

Do

- ☐ Make a Calcium Record and do Microscope Work.
- ☐ Make your own Joints.
- ☐ Add to the Human Body Project.

Supplies Needed	
Demo	• 2 Raw chicken bones, Gloves, 2 Plastic bags, Vinegar
Projects	• Brad, Cardstock, Scissors, Hole punch, Microscope slide of bone tissue

Chapter 3: The Catacombs

Read: Gathering Information

Living Book Reading Assignment

- 🕮 Chapter 3 of *The Sassafras Science Adventures Volume 2: Anatomy*

(Optional) Encyclopedia Readings

- *The Kingfisher First Encyclopedia of the Human Body* pp. 24-25 (Bones and Joints)
- *DK First Human Body Encyclopedia* pp. 18-19 (The Living Bone), pp. 22-23 (Moving Joints)
- *DK Eyewitness Human Body* pp. 18-19 (Inside Bones), pp. 20-21 (Joints between bones)
- *The Kingfisher Science Encyclopedia* pp. 104-105 (Bones and Joints)

(Optional) Additional Library Books

- 🕮 *Bones: Skeletons and How They Work* by Steve Jenkins
- 🕮 *Bones (Step-Into-Reading, Step 2)* by Stephen Krensky
- 🕮 *Bones: Our Skeletal System* by Seymour Simon
- 🕮 *Watch Me Grow: Fun Ways to Learn About Cells, Bones, Muscles, and Joints* by Michelle O'Brien-Palmer

Write: Keeping a Notebook

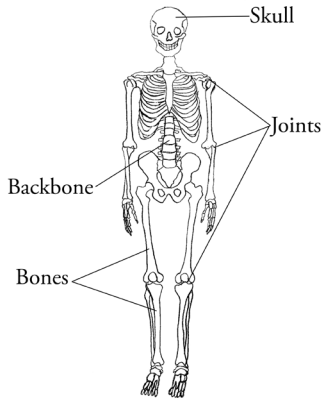
SCIDAT Logbook Sheets

This week, you can have the students begin to fill out a Body System Information Sheet for the Skeletal System and a logbook page for skull and backbone. The students could include the following information:

Body System Information Sheet - The Skeletal System

Purpose of the system: Nothing to add from this chapter.

Parts of the System: Have the students label the bones and joints. (Note—You can have older students label the major bones of the body, such as the ribs, femur, humerus, and more.)

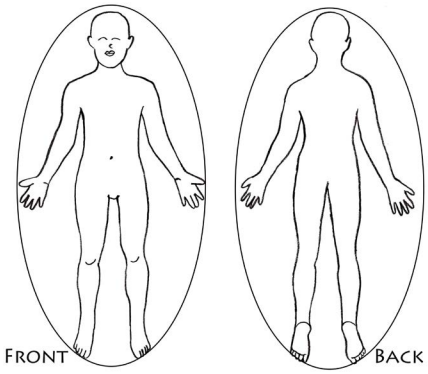


Facts about the System

- Long bones of the arms join the central core of the skeleton at the shoulder.
- The long bones of the leg join the central core of the skeleton at the hips.
- The bones of the arms and legs, along with the shoulder and hip, make up the appendicular skeleton.

Anatomy Record Sheet - Bones

Location Found on the Body



Body Part: Bones

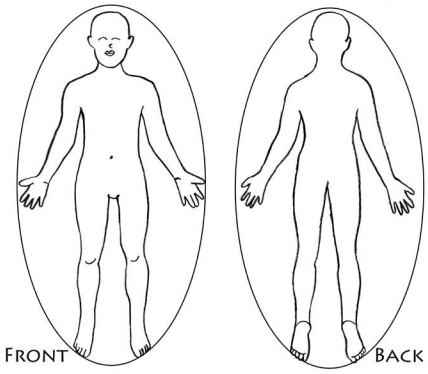
Bones are a Part of the: Skeletal System

Information Learned

- There are four main types of bones:
  - ⇨ Flat bones, which give protection and provide surfaces for muscle attachment (such as ribs or shoulder blades).
  - ⇨ Short bones, which are knobby and nugget shaped (such as the bones of the ankles and wrists).
  - ⇨ Long bones, which are longer than they are wide (such as the bones of the arm and leg).
  - ⇨ Irregular bones, which have complicated shapes and don't fit into the other three categories (such as vertebrae).
- The smallest bones are the three ossicles in your ear, known as the hammer, anvil, and stirrup.
- The largest and longest bone of the body is the thighbone, or femur.
- It supports the weight of the body when you stand, run, or jump.
- Bones are living organs with their own cells and blood supply.
- They have an outer layer of compact bone cells that surrounds a layer of lighter sponge-like bone, which is filled with jelly-like bone marrow.
- Compact bone is made up of bony tubes that are bundled together, making it very strong.
- Spongy bone is a honeycomb structure made up of spaces and bony strands.
- The spaces in the spongy bone are filled with bone marrow.
- There are two types of bone marrow found in the center of the bones:
  - ⇨ The red marrow, which is responsible for making red blood cells.
  - ⇨ The yellow marrow, which is responsible for storing fat.

Anatomy Record Sheet - Joints

Location Found on the Body



Body Part: Joints

Joints are a Part of the: Skeletal System

Information Learned

- Joints are moveable points that allow the skeleton to move.
- The body has over four hundred joints.
- There are different types of joints that allow for different types of movements.
- Hinge joints work like a door hinge and they allow for bones to move up and down, but not side to side. Examples are your knee and elbow joints.
- Ball and socket joints allow for movement in many directions because they have a rounded end of a bone that fits into a cup-shaped socket of another bone. Examples are the shoulder and the hip joints.
- Condyloid joints, which are found in the fingers and toes, have an oval ball and socket joint that allows for the fingers to swivel, but not rotate.
- Pivot joints allow for side to side movement where one bone pivots around another one.

Examples of this are the atlas and axis bones in your neck.
- Gliding or sliding joints allow small sliding movement between two bones. Examples are the bones of the wrist and the knee cap.
- Ligaments hold the two bones in place within the joint.
- The ends of each of the bones at the joint are cover with cartilage which allows them to slide over each as they move.

Vocabulary

Have the older students look up the following terms in the glossary in the appendix on pp. 143-145 or in a science encyclopedia. Then, have them copy the definition onto a blank index card or into their SCIDAT logbook.

- Bone – A hard, white, living tissue that makes up the skeleton of the human body.
- Joint – A place in the body where two bones meet.
- Cartilage – A tough, flexible tissue that cushions joints and makes body parts such as the ears and trachea.

(Optional) Copywork

Copywork Sentence

Bones are living organs with their own cells and blood supply.

Dictation Selection

There are four main types of bones—the flat bones, the short bones, the long bones, and the irregular bones. All bones are living organs with their own cells and blood supply. Joints are movable points that allow the skeleton to move. The body has over four hundred joints.

(Optional) Quiz

This week, you can give the students a quiz based on what they learned in chapters 2 and 3. You can find this quiz in the appendix on p. 155.

Quiz #1 Answers

1. D
2. C
3. B
4. A
5. C, A, D, B
6. A

Do: Playing with Science

Scientific Demonstration: Rubber Bones

Materials

- ☑ 2 Raw chicken bones
- ☑ Gloves
- ☑ 2 Plastic bags
- ☑ Vinegar

Procedure

1. Have the students put on the gloves before handling the raw chicken bones.
2. Have them place one of the bones in a plastic bag by itself and seal the bag. Have them place the other bone in another bag, cover it with vinegar, and seal the bag.
3. Place both bones in the refrigerator over night.
4. The next day, take both bags out, pour the vinegar out of the one bag, and reseal it. Allow the students to observe the differences between the two bones. Ask the students:

   ? Can you bend either of the bones?

Explanation

The students should see that the bone that was soaked in the vinegar is much more pliable. They should be able to bend it easily. This is because the vinegar has dissolved the calcium contained in the bone. Calcium serves to strengthen and build up the bone, once it is gone all that is left is the soft bone tissue, which makes the bone weaker and more flexible.

Take It Further

Add a third bone that has been cooked to the demonstration. How does it differ from the raw bone and the bone soaked in vinegar? (It should be much tougher and much more brittle.)

(Optional) STEAM Projects

Multi-chapter Activities

✂ Human Body Project – This week, add a long bone to the human body project.

Activities For This Chapter

✂ Calcium Record – The FDA recommends eating one to two cups of milk or other calcium-rich food a day for children ages 4 to 8, and it recommends eating three cups for children ages 9 to 12. Calcium-rich foods include yogurt, cheese, tofu, calcium-fortified 100% orange juice, and dark leafy green vegetables like collard greens or spinach. Have the students track how much calcium they consume in a typical day or week.

✂ Make your own Joints – You will need a brad, cardstock, scissors, and a hole punch to make a pivot joint. You will need two lengths of 1'x2' boards, a hinge, a screwdriver, and several screws to make a hinge joint. You will need two dominoes and two rubber bands to make a gliding joint. You will need one length of ½" plastic pipe, one length of ¾" plastic pipe, one ½" plastic pipe tee, one ¾" plastic pipe tee, a pipe saw, and two rubber bands to make a ball and socket joint. See the appendix p. 133 for directions for this project.

✂ Microscope Work – Purchase a prepared slide of bone cells and look at it under your microscope. Complete a microscope worksheet found on p. 131 or p. 132 of the appendix. If you do not own a microscope, you can view bone cells at the following website:

http://physioweb.org/skeletal/bone_tissue.html

Anatomy Quiz #1

Chapters 2 and 3

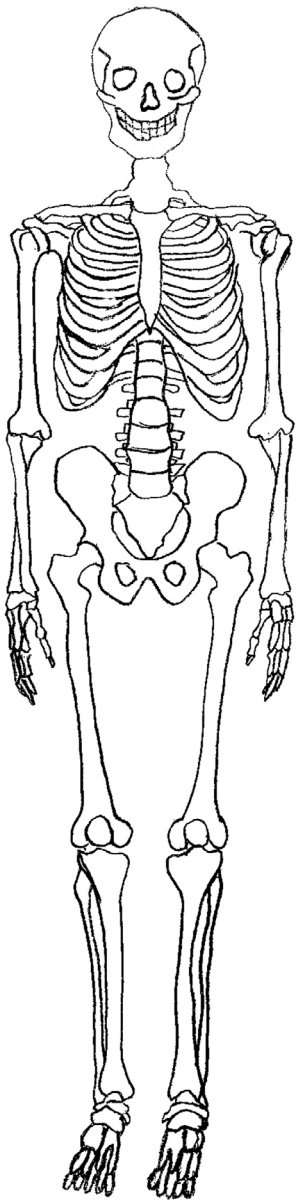
1. The skeletal system _____.

    A. Includes the bones and tissue

    B. Anchors the muscles

    C. Supports the body

    D. All of the above



2. The skeleton has _____ bones.

    A. 40

    B. 100

    C. 206

    D. 350

3. The main job of the skull is to _____.

    A. Help you move

    B. Protect the brain

    C. Both A and B

    D. None of the above

4. The backbone provides a protective tunnel for the _____.

A. Spinal cord

B. Back muscles

C. Skin cells

D. None of the above

5. Match the type of bone to what it does.

Flat bones _____

Short bones _____

Long bones _____

Irregular bones _____

A. Are knobby and nugget shaped (such as the bones of the ankles and wrists)

B. Have complicated shapes and don't fit into the other three categories (such as vertebrae)

C. Give protection and provide surfaces for muscle attachment (such as ribs or shoulder blades)

D. Are longer than they are wide (such as the bones of the arm and leg)

6. Joints allow the _____ to move.

A. Skeleton

B. Skin

C. Muscles

D. None of the above