

THE SASSAFRAS GUIDE TO ANATOMY



WRITTEN BY PAIGE HUDSON

THE SASSAFRAS GUIDE TO ANATOMY

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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 the 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.

The books of 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 logbook to correspond with 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 with the chapters in *The Sassafras Science Adventures Volume 2: Anatomy*. They are meant 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 that you can use to teach your 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 a summary of the corresponding chapter in *The Sassafras Science Adventures Volume 2: Anatomy*. Then, there will be an overview of the supplies you will need for the demonstration, projects, and activities for the chapter. After that you will find the optional schedules – one for two days a week and one for five days a week. These schedules are included to give you an idea of how your week could be organized, so please feel free to alter them around to suit your needs.

After the week-at-a-glance information, you will find the information for the reading, notebooking, and activities for the particular chapter. This information is divided into the following sections:

SCIENCE-ORIENTED BOOKS

① **LIVING BOOK SPINE** – This section contains the corresponding chapter in *The Sassafras Science Adventures Volume 2: Anatomy*.

📖 **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.

📖 **ADDITIONAL LIVING 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.

NOTEBOOKING

⇒ **SCIDAT LOGBOOK INFORMATION** – This section has the information that the students could have included in their SCIDAT logbook. It contains possible answers for the body system information and the anatomy record sheets. The students may or may not have all of the same information on their

notebooking sheets, which is fine. You want their SCIDAT logbook to be a record of what they have learned. The information included is meant for you to use as a guide as you check their work. For more information about notebooking, please read the following article:

☞ What is notebooking? – <http://sassafrasscience.com/what-is-notebooking/>

- ☞ **VOCABULARY** – This section includes vocabulary words that coordinate with each chapter. If your students are older, I 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.

SCIENTIFIC DEMONSTRATIONS OR OBSERVATIONS

- ☑ **SCIENTIFIC DEMONSTRATION** – This section includes a list of materials, the instructions and an explanation for a scientific demonstration which coordinates with the chapter. There is a blank lab report sheet provided for you in the Appendix on pp. 107-108 if you wish for your student to write-up the demonstration. If your students are in grade 4 or higher, I recommend that they complete at least one of these for this course.

MULTI-WEEK PROJECTS OR ACTIVITIES

- ☞ **ADDITIONAL ACTIVITIES** – This section contains additional activities that go along with the chapter. There are multi-week projects which will be done over several chapters and activities that coordinate with that specific chapter. Pick and choose the activities that interest you and your student.

MEMORIZATION

- ☞ **COPYWORK AND DICTATION** – 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 student's abilities. You can also use the selections as memory work assignments for the students.

ADDITIONAL MATERIALS

In the back of this guide there are a few additional materials for your convenience. The first is a glossary of terms, which you can use with your students as they define the words for each chapter. After that, you will find a set of eight simple quizzes that you can use with your students to verify if you students are retaining the material.

A WORD ABOUT THE SCIDAT LOGBOOK

The SCIDAT logbook is meant to be a record of your 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 pre-made 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 one has been attractively illustrated for you so that you don't have to track down pictures for the students to use. This way they are able to 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 info@elementalscience.com. I will be more than happy to answer them as soon as I am able. I hope that you and your students enjoy your journey through anatomy with the Sassafras twins.

BOOK LIST

MAIN TEXT

The following book is required reading for the activities suggested in this guide.

① *The Sassafras Science Adventures Volume 2: Anatomy*

ENCYCLOPEDIA READINGS

The following encyclopedias have suggested pages scheduled in this guide. I recommend that you choose the one that best suits the age and ability of your students.

- 🔍 *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)

RECOMMENDED RESOURCES

The following book will be very beneficial to have when completing this course. It contains all the pages and pictures your students will need to record their journey through anatomy

🔗 *The Official Sassafras Student SCIDAT Logbook: Anatomy Edition*

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:

🔗 <http://sassafrasscience.com/volume-2-links/>

ADDITIONAL LIVING BOOKS LISTED BY CHAPTER

CHAPTER 1

- 📖 *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

CHAPTER 2

- 📖 *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

CHAPTER 3

- 📖 *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

CHAPTER 4

- 📖 *The Respiratory System: Why Do I Feel Out of Breath?* by Sue Barraclough

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=&q=question=>
- 🔗 Home Science Tools: <http://www.hometrainingtools.com/mammal-organs-dissection-kit/p/DE-ORGANS/>

DEMONSTRATION SUPPLIES LISTED BY CHAPTER

CHAPTER 1: OBSERVATION WALK

No supplies needed.

CHAPTER 2: SUPPORT SYSTEM

Mini marshmallows

Toothpicks

CHAPTER 3: RUBBER BONES

2 Raw chicken bones

Gloves

2 Plastic bags

Vinegar

CHAPTER 4: OUT OF BREATH

Watch with a second hand

CHAPTER 5: BOTTLE LUNGS

Small plastic bottle

2 Balloons – one large, one small

Straw

Rubber band

Scissors

Tape

Modeling clay

CHAPTER 6: TESTING REFLEXES

Book

Wire screen

Cotton ball

CHAPTER 7: BLIND TASTE TEST

Several types of food

Several paper plates

Blindfold

CHAPTER 8: HEARTBEAT

Stethoscope or paper towel tube

CHAPTER 9: HOW STRONG AM I?

Objects of varying weights

Scale

CHAPTER 10: FALLING FOOD

Several slices of bread (or other non-choking hazard food that your students can eat and enjoy)

CHAPTER 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

CHAPTER 12: PICTURE FAMILY TREE

Pictures of your family up to grandparents

CHAPTER 13: SPREADING GERMS

Several friends
Several different colors of glitter

CHAPTER 14: CELL MEMBRANE

Balloon
Eye dropper
Cotton ball
Mint (or Vanilla) Extract
Large box with a lid and no holes

CHAPTER 15: ADRENALINE RUSH

Two types of music – one very slow, one fast

CHAPTER 16: SEEING SKIN

Food coloring
Magnifying glass

CHAPTER 17: HOW STRONG IS HAIR?

Pennies (10-30)
Piece of hair (at least 5 inches long)
Several heavy books
Pencil
Tape

CHAPTER 18: FOOD AND EXERCISE DIARY

Notebook

PROJECT AND ACTIVITY SUPPLIES LISTED BY CHAPTER

The projects and activities 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 clear tape, glue, scissors, a variety of paint colors, and a set of markers.

CHAPTER 1

Butcher paper

CHAPTER 2

Water balloons

Protective materials (such as fabric, bubble wrap, or cardboard)

6 Spools of thread

Cardboard

String

CHAPTER 3

Brad

Cardstock

Hole punch

Microscope slide of bone tissue

CHAPTER 4

Mirror

Cotton balls

Straws

CHAPTER 5

Plastic wrap

2 Straws

Spray oil

Microscope slide of lung tissue

CHAPTER 6

Different colors of modeling clay

Sheep's brain dissection kit

Microscope slide of brain cells

CHAPTER 7

Balloons

Beans

Rice

Salt

Clay

Sheep's eye dissection kit

CHAPTER 8

Sheep's hear dissection kit

Microscope slide with red blood cells

CHAPTER 9

Long cardboard tube
Rubber band
String
2 Long balloons
Microscope slide of muscle cells

CHAPTER 10

Large Ziploc bag
Bread
Coke
Microscope slide of the salivary gland

CHAPTER 11

Balloon
Funnel
Water
Sheep's kidney dissection kit

CHAPTER 12

Different colors of LEGO blocks

CHAPTER 13

Several magazines
Poster board

CHAPTER 14

Jell-O
Grape
Materials for organelles

CHAPTER 15

Puzzle pieces
Microscope slide of epithelial cells

CHAPTER 16

Paper
Magnifying glass
Stamp ink
Microscope image of skin cells

CHAPTER 17

Paper
Several students
Microscope slide
Piece of hair

CHAPTER 18

No supplies needed.

CHAPTER 1: ADVENTURES IN ANATOMY

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.

SUPPLIES NEEDED

Experiment	Projects and Activities
• No Supplies Needed	• Butcher paper

OPTIONAL SCHEDULES FOR TWO-DAYS-A-WEEK

Day 1	Day 2
<input type="checkbox"/> Read Chapter 1 in <i>SSA Volume 2: Anatomy</i> . <input type="checkbox"/> Set up your students' SCIDAT logbook. <input type="checkbox"/> Do the demo** entitled "Observation Walk"; write observations on SL*** pg. 5. <input type="checkbox"/> Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL pg. 6.	<input type="checkbox"/> Read the assigned pages from the encyclopedia of your choice; write narration on the Anatomy Notes Sheet on SL pg. 6. <input type="checkbox"/> Read one of the additional living books from your library; write narration on the Anatomy Notes Sheet on SL pg. 6. <input type="checkbox"/> Play a game of "I Spy".

OPTIONAL SCHEDULE FOR FIVE-DAYS-A-WEEK

Day 1	Day 2	Day 3	Day 4	Day 5
<input type="checkbox"/> Read the section entitled "Breakfast at Cecil's" of Chapter 1 in <i>SSA Volume 2: Anatomy</i> . <input type="checkbox"/> Set up your students' SCIDAT logbook.	<input type="checkbox"/> Read the section entitled "Socrates and Aristotle" of Chapter 1 in <i>SSA Volume 2: Anatomy</i> . <input type="checkbox"/> Do the demo entitled "Observation Walk"; write observations on SL pg. 5.	<input type="checkbox"/> Read the assigned pages from the encyclopedia of your choice; write narration on the Anatomy Notes Sheet on SL pg. 6.	<input type="checkbox"/> Read one of the additional living books from your library; write narration on the Anatomy Notes Sheet on SL pg. 6.	<input type="checkbox"/> Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL pg. 6. <input type="checkbox"/> Play a game of "I Spy".

*SSA = *The Sassafras Science Adventures*

**demo = Scientific Demonstration

***SL = *The Official Sassafras SCIDAT Logbook: Anatomy Edition*

SCIENCE-ORIENTED BOOKS

LIVING BOOK SPINE

- 📖 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)



ADDITIONAL LIVING 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

NOTEBOOKING (SCIDAT LOGBOOK INFORMATION)

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. 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 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. 119-120 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.)

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. What you choose to do will depend on the ages and abilities of your students.

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.

🔗 <http://elementalblogging.com/what-is-nature-study>

🔗 <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?*

MULTI-WEEK PROJECTS AND ACTIVITIES

MULTI-WEEK PROJECTS

✂ **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. 123-124. I have also included pictures of the body parts in the Appendix of this guide on pg. 125 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 WEEK

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

MEMORIZATION

COPYWORK/DICTATION

☞ 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.*

NOTES

CHAPTER 2: ETHIOPIA, HERE WE COME!

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 awning 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.

SUPPLIES NEEDED

Experiment	Projects and Activities
<ul style="list-style-type: none"> • Mini marshmallows • Toothpicks 	<ul style="list-style-type: none"> • Water balloons, Protective materials (fabric, bubble wrap, or cardboard) • 6 Spools of thread, Cardboard, String

OPTIONAL SCHEDULES FOR TWO-DAYS-A-WEEK

Day 1	Day 2
<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “The Surprising Skull” of Chapter 2 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 9 for the skull. <input type="checkbox"/> Complete the Around the World sheet for Ethiopia on SL pg. 8. <input type="checkbox"/> Go over the vocabulary words and enter them into the Anatomy Glossary on SL pg. 105. <input type="checkbox"/> Choose one of the activities for this week to do. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “Stories and Spines” of Chapter 2 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 10 for the backbone; Fill out the Body Systems Sheet on SL pg. 7 for the skeletal system. <input type="checkbox"/> Do the demo entitled “Support System”; write information learned on SL pg. 13. <input type="checkbox"/> Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL pg. 13. <input type="checkbox"/> Work on one or all of the multi-week activities.

OPTIONAL SCHEDULE FOR FIVE-DAYS-A-WEEK

Day 1	Day 2	Day 3	Day 4	Day 5
<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “The Surprising Skull” of Chapter 2 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 9 for the skull. <input type="checkbox"/> Go over the vocabulary words and enter them into the Anatomy Glossary on SL pg. 105. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “Stories and Spines” of Chapter 2 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 10 for the backbone. <input type="checkbox"/> Fill out the Body Systems Sheet on SL pg. 7 for the skeletal system. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read one or all of the assigned pages from the encyclopedia of your choice; write narration on the Anatomy Notes Sheet on SL pg. 13. <input type="checkbox"/> Do the demo entitled “Support System”; write information learned on SL pg. 13. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read one of the additional library books. <input type="checkbox"/> Complete the Around the World sheet for Ethiopia on SL pg. 8. <input type="checkbox"/> Choose one of the activities for the week to do; fill out the project record sheet on pg. 15. 	<ul style="list-style-type: none"> <input type="checkbox"/> Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL pg. 13. <input type="checkbox"/> Work on one or all of the multi-week activities.

SCIENCE-ORIENTED BOOKS

LIVING BOOK SPINE

- 📖 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)



ADDITIONAL LIVING 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

NOTEBOOKING (SCIDAT LOGBOOK INFORMATION)

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. Here's the information they could include:

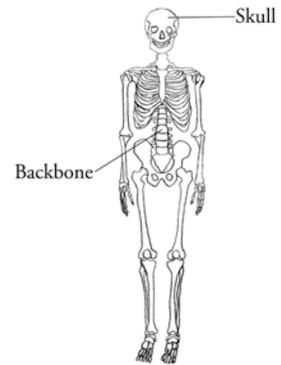
BODY SYSTEM INFORMATION SHEET: THE SKELETAL SYSTEM

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

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 SHEETS

BODY PART: *The Skull*

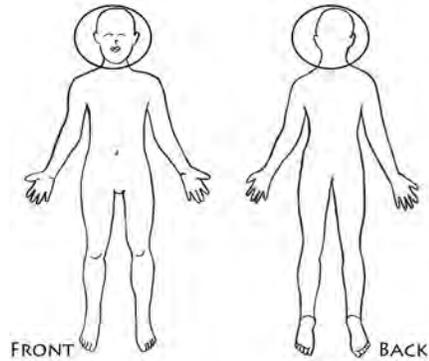
THE SKULL IS A PART OF THE: *Skeletal System*

INFORMATION LEARNED

The students could have included any number of facts from the list below.

- ⇒ *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.*

LOCATION FOUND ON THE BODY



BODY PART: *The Backbone*

THE BACKBONE IS A PART OF THE:

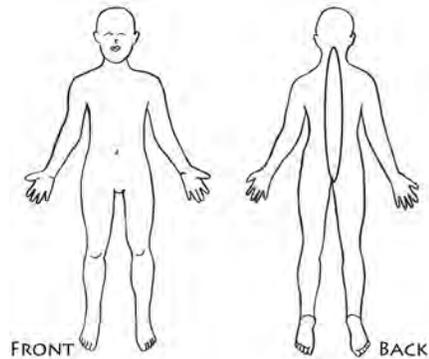
Skeletal System

INFORMATION LEARNED

The students could have included any number of facts from the list below.

- ⇒ *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.*

LOCATION FOUND ON THE BODY



VOCABULARY

Have the older students look up the following terms in the glossary in the Appendix on pp. 119-120 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.

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.
3. 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.*)

MULTI-WEEK PROJECTS AND ACTIVITIES

MULTI-WEEK PROJECTS

- ✂ HUMAN BODY PROJECT – This week, add the skull and the backbone to your human body project.

ACTIVITIES FOR THIS WEEK

- ✂ 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.

MEMORIZATION

COPYWORK/DICTATION

📖 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.

CHAPTER 3: THE CATACOMBS

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 awning 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.

SUPPLIES NEEDED

Experiment	Projects and Activities
<ul style="list-style-type: none"> • 2 Raw chicken bones, Gloves • 2 Plastic bags, Vinegar 	<ul style="list-style-type: none"> • Brad, Cardstock, Scissors, Hole punch • Microscope slide of bone tissue

OPTIONAL SCHEDULES FOR TWO-DAYS-A-WEEK

Day 1	Day 2
<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “Blocks and Bones” of Chapter 3 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 11 for the bones. <input type="checkbox"/> Fill out the Body Systems Sheet on SL pg. 7 for the skeletal system. <input type="checkbox"/> Go over the vocabulary words and enter them into the Anatomy Glossary on SL pp. 105 - 106. <input type="checkbox"/> Choose one of the activities for this week to do. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “Jumping Joints” of Chapter 3 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 12 for the joints. <input type="checkbox"/> Do the demo entitled “Rubber Bones”; write information learned on SL pg. 14. <input type="checkbox"/> Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL pg. 14. <input type="checkbox"/> Work on one or all of the multi-week activities.

OPTIONAL SCHEDULE FOR FIVE-DAYS-A-WEEK

Day 1	Day 2	Day 3	Day 4	Day 5
<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “Blocks and Bones” of Chapter 3 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 11 for the bones. <input type="checkbox"/> Go over the vocabulary words and enter them into the Anatomy Glossary on SL pp. 105 - 106. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read the section entitled “Jumping Joints” of Chapter 3 in <i>SSA Volume 2: Anatomy</i>. <input type="checkbox"/> Fill out an Anatomy Record Sheet on SL pg. 12 for the joints. <input type="checkbox"/> Fill out the Body Systems Sheet on SL pg. 7 for the skeletal system. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read one or all of the assigned pages from the encyclopedia of your choice; write narration on the Anatomy Notes Sheet on SL pg. 14. <input type="checkbox"/> Do the demo entitled “Rubber Bones”; write information learned on SL pg. 14. 	<ul style="list-style-type: none"> <input type="checkbox"/> Read one of the additional library books. <input type="checkbox"/> Choose one of the activities for the week to do; fill out the project record sheet on pg. 16. 	<ul style="list-style-type: none"> <input type="checkbox"/> Do the copywork or dictation assignment and add it to the Anatomy Notes sheet on SL pg. 14. <input type="checkbox"/> Work on one or all of the multi-week activities.

SCIENCE-ORIENTED BOOKS

LIVING BOOK SPINE

- 📖 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)



ADDITIONAL LIVING 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

NOTEBOOKING (SCIDAT LOGBOOK INFORMATION)

This week, you can have the students finish filling out a Body System Information Sheet for the Skeletal System and a logbook page for the bones and the joints. Here's the information they could include:

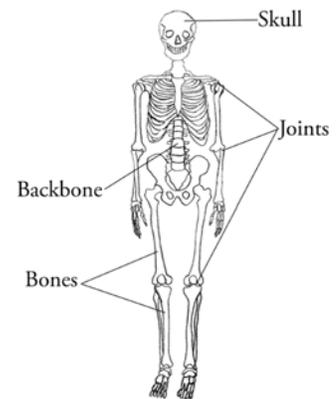
BODY SYSTEM INFORMATION SHEET: THE SKELETAL SYSTEM

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 SHEETS

BODY PART: *Bones*

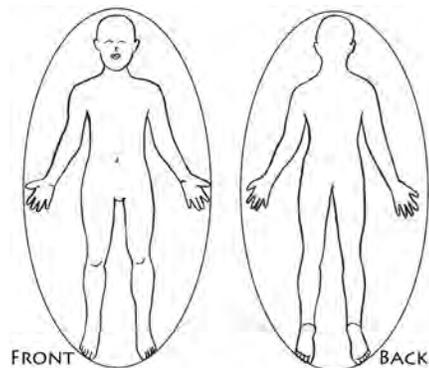
BONES ARE A PART OF THE: *Skeletal System*

INFORMATION LEARNED

The students could have included any number of facts from the list below.

- ⇒ There are four main types of bones:
 - Flat bones, which give protection and provide surfaces for muscle attachment (such as ribs or shoulder blades);

LOCATION FOUND ON THE BODY



- *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.*

BODY PART: *Joints*

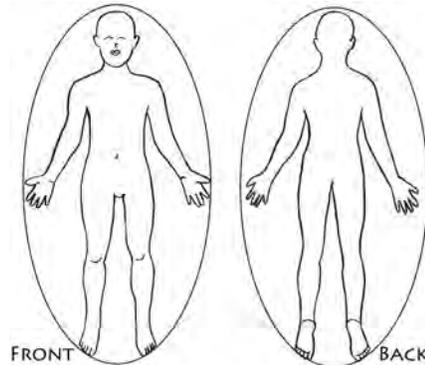
JOINTS ARE A PART OF THE: *Skeletal System*

INFORMATION LEARNED

The students could have included any number of facts from the list below.

- ⇒ *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.*
- ⇒ *Condylod 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.*
- ⇒ *The ends of each of the bones at the joint are cover with cartilage which allows them to slide over each as they move.*
- ⇒ *Ligaments hold the two bones in place within the joint.*

LOCATION FOUND ON THE BODY



VOCABULARY

Have the older students look up the following terms in the glossary in the Appendix on pp. 119-120 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.

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.
5. 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.*)

MULTI-WEEK PROJECTS AND ACTIVITIES

MULTI-WEEK PROJECTS

✂ **HUMAN BODY PROJECT** – This week, add a long bone to your human body project.

ACTIVITIES FOR THIS WEEK

✂ **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 your 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 1x2 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 pg. 111 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 pg. 109 or 110 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

MEMORIZATION

COPYWORK/DICTATION

☞ 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.

NOTES

QUIZZES

ANATOMY QUIZ ANSWERS

QUIZ #1

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

QUIZ #2

1. C
2. F
3. B, A
4. larynx, trachea
5. A
6. B

QUIZ #3

1. C
2. C
3. brain, body
4. B
5. E
6. D
7. C
8. A

QUIZ #4

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

QUIZ #5

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

QUIZ #6

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

QUIZ #7

1. B, A, C
2. F, D, E, C, B, A
3. D
4. B

QUIZ #8

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

ANATOMY QUIZ #1

CHAPTERS 2 AND 3

1. The skeletal system _____.

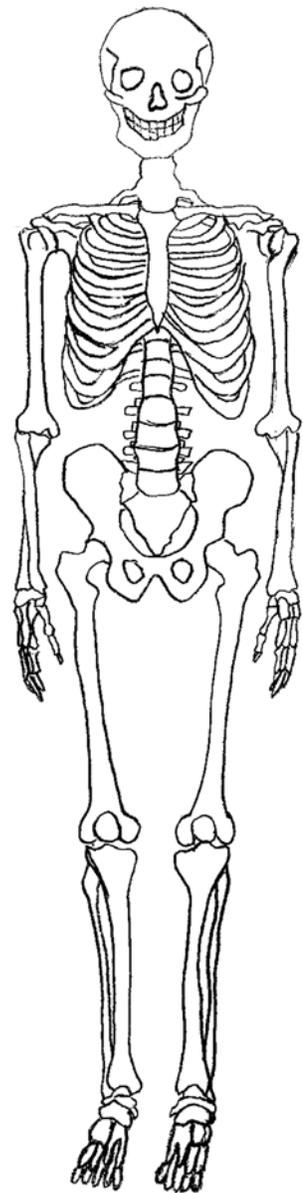
- A. Includes the bones and tissue
- B. Anchors the muscles
- C. Supports the body
- D. All of the above

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 _____ | A. Are knobby and nugget shaped (such as the bones of the ankles and wrists) |
| Short bones _____ | B. Have complicated shapes and don't fit into the other three categories (such as vertebrae) |
| Long bones _____ | C. Give protection and provide surfaces for muscle attachment (such as ribs or shoulder blades) |
| Irregular bones _____ | 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