In preparation for this high school anatomy and physiology course, please review the introductory information.

**Supplies:** binder separated for six units, paper, pen

**Resources:**

1. An anatomy and physiology textbook that can be found at OpenStax online at [https://cnx.org/contents/FPtK1zmh@8.119:zMTtFGyH@4/Introduction](https://cnx.org/contents/FPtK1zmh@8.119:zMTtFGyH@4/Introduction). Download the PDF version. After clicking the link above, click the green button that says, “Get This Book!” Consider saving it to your computer.

2. Virtual dissection: [https://www.getbodysmart.com/skeletal-system](https://www.getbodysmart.com/skeletal-system)


**Notes:** There will be many online links in this lesson plan. Be prepared to (1) wait for each to load; (2) copy and paste the link to your browser if clicking directly on the link does not work; and (3) ask permission from a parent if you would like to research the topic further online.

**Parents:** *Due to the nature of the course, the textbook includes simple drawings of naked men and women. Please scan the textbook to determine whether or not each lesson’s text is appropriate for your student.*

**Additional resources:**


**Scope and Sequence**

The topics in this human anatomy and physiology course adhere to the scope and sequence followed by most two-semester courses nationwide for high school students. The content follows an advanced level, but you can reduce the number of assignments per lesson for a less rigorous journey.

The answers to the Review and Critical-Thinking questions are located in the back of the textbook.
Unit 1: Levels of Organization

Weeks 1–13 provide the student with a basic understanding of human anatomy and physiology, including its language, the levels of organization, and the basics of chemistry and cell biology. These lessons provide a foundation for the further study of the body. They also focus particularly on how the body’s regions, important chemicals, and cells maintain homeostasis.

Objectives:
- Distinguish between anatomy and physiology
- Identify the functional characteristics of human life
- Identify the four requirements for human survival

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| Week 7, 2.1: Elements and Atoms: The Building Blocks of Matter | Week 13, 4.1: Types of Tissues |
| Week 8, 2.2: Chemical Bonds | Week 13, 4.2: Epithelial Tissue |
| Week 8, 2.3: Chemical Reactions | Week 13, 4.3: Connective Tissue Supports and Protects |
| Week 9, 2.4: Inorganic Compounds Essential to Human Functioning | Week 13, 4.4: Muscle Tissue and Motion |
| Week 9, 2.5: Organic Compounds Essential to Human Functioning | |

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Unit 2: Support and Movement

Weeks 14–20, starting with the integumentary system consisting of the skin, the largest organ of the body, then skeletal and muscular systems, following a traditional sequence of topics. This unit is the first to walk students through specific systems of the body, and as it does so, it maintains a focus on homeostasis as well as those diseases and conditions that can disrupt it.

Objectives

- Explore the present biggest organ of the body, Integumentary system
- Identify the functional characteristics Skeletal System
- Identify the functional characteristics of the Muscular System

### Week 14: The Integumentary System
- Lessons 1 & 2, 5.1: Layers of the Skin
- Lesson 3, 5.2: Accessory Structures of the Skin
- Lesson 4, 5.3: Functions of the Integumentary System
- Lesson 5, 5.4: Diseases, Disorders, and Injuries of the Integumentary System

### Week 18: Joints
- Lesson 1, 9.1: Classification of Joints
- Lesson 2, 9.2: Fibrous Joints; 9.3: Cartilaginous Joints
- Lesson 3, 9.4: Synovial Joints
- Lesson 4, 9.5: Types of Body Movements
- Lesson 5, 9.6: Anatomy of Selected Synovial Joints; 9.7: Development of Joints

### Week 15: Bone Tissue & Skeletal System
- Lesson 1, 6.1: The Functions of the Skeletal System
- Lesson 2, 6.2: Bone Classification
- Lesson 3, 6.3: Bone Structure
- Lesson 4, 6.4: Bone Formation and Development
- Lesson 5, 6.5: Fractures: Bone Repair
- Lesson 5, 6.6: Exercise, Nutrition, Hormones, and Bone Tissue
- Lesson 5, 6.7: Calcium Homeostasis: Interactions of the Skeletal System and Other Organ Systems

### Week 19: Muscle Tissue
- Lesson 1, 10.2: Skeletal Muscle
- Lessons 2, 10.3: Muscle Fiber Contraction and Relaxation
- Lesson 3, 10.4: Nervous System Control of Muscle Tension; 10.5 Types of Muscle Fibers
- Lesson 4, 10.6: Exercise and Muscle Performance
- Lesson 5, 10.7: Cardiac Muscle Tissue; 10.8 Smooth Muscle
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<td>Lesson 3, 7.3: The Vertebral Column, Part 1</td>
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_SchoolhouseTeachers.com note: Parents should closely monitor children’s use of YouTube and Wikipedia if you navigate away from the videos and articles cited in these lessons. We also recommend viewing the videos on a full-screen setting in order to minimize your students’ exposure to potentially offensive ads and inappropriate comments beside or beneath the video._
Unit 1: Levels of Organization

Week 1: Fearfully and Wonderfully Made

Lesson 1: God created you amazingly!

Listen to https://www.icr.org/article/amazing-human-body/. (It is about 13 minutes.)


Lesson 2

Read: Psalm 139:13-16, NKJV

13 For You formed my inward parts (organs); You covered me in my mother’s womb (organ).
14 I will praise You, for I am fearfully and wonderfully made; Marvelous are Your works, And that my soul knows very well.
15 My frame (system) was not hidden from You, When I was made in secret, And skillfully wrought in the lowest parts of the earth.
16 Your eyes saw my substance, being yet unformed. And in Your book they all were written, The days fashioned for me, When as yet there were none of them.

Respond to the following in your notebook:

• What does God say about your body in this psalm?
• What systems(s) of the body do you see in the scriptures above?

Lesson 3: From Big to Small, God Made It All

Our universe is unbelievably immense. Can you count the stars in the heavens or the grains of sand on the beach? Mr. Sherwin directs our eyes to the skies—and the submicroscopic world around us—to inspire wonder and worship of our awesome, majestic Creator.

Listen: https://www.icr.org/article/from-big-to-small-god-made-it-all.

Read Psalm 8. Here we read David’s praise of God in regard to the works of His hand.
Lesson 1

Read and take notes on pages 7–9 in Anatomy and Physiology.

Read an introduction to anatomy: https://www.worldbookonline.com/advanced/article?id=ar020300&st=anatomy#tab=homepage

Read an introduction to physiology: https://www.worldbookonline.com/advanced/article?id=ar428660&st=physiology#tab=homepage

Read this World Book article about the human body, stopping at “What the body is made of.” https://www.worldbookonline.com/student-new/#/article/home/266440

Lesson 2

Define the following terms and place in your notebook. Learn the terms and have someone else quiz you.

- Anatomy
- Gross anatomy
- Homeostasis
- Microscopic anatomy
- Physiology
- Regional anatomy
- Systemic anatomy

Watch “Leonardo da Vinci: Anatomist” (https://www.youtube.com/watch?v=SdxEF51kY_4)

Read about Andreas Vesalius: https://www.worldbookonline.com/student-new/#/article/home/ar584100/Anatomy

Watch the video about Real Bodies, an exhibition that can be found at various science centers around the US: https://ctsciencecenter.org/real-bodies/

Lesson 3

Complete:
- Review questions: 6 and 7 on page 37.
- Critical-Thinking Questions: 28 and 29 on page 39
This week we will focus on the basic architecture of the body. Consider the architecture of a building. It is made of individual components that come together to form a larger structure. This is the same with the human body. Simple levels of organization increase in complexity.

**Read** Section 1.2, pp. 9-14 of the textbook.

**Review** Figure 1.3 on page 10. The smallest component is an element. These become compounds, which then become cells. The cells combine to form tissues. A number of tissues together form organs. A group of organs comprise an organ system.

Though you may have learned about the cell in previous science classes, let’s spend a little bit of time reviewing.

**Watch** [this video](https://www.youtube.com/watch?v=URUJD5NEXC8) and define the function of each of the component parts of the animal cell.

**Create** your own, if you have time. Have fun with this. Use the websites below as a guide, or design your own.

- [https://owlcation.com/stem/3d-cell-model](https://owlcation.com/stem/3d-cell-model)
Lesson 2

Now that you’ve reviewed cells, let’s move on to tissue. One type of tissue is muscle tissue. The human body consists of three different types of muscle: skeletal, cardiac, and smooth. Find an image online and draw and label the three types of muscles. Answer the following questions: Where is each found? What is its function? How does it work?

https://www.youtube.com/watch?v=PJDrR3sZPZU
https://www.youtube.com/watch?v=C85TbgoAiiY
https://www.toppr.com/guides/biology/locomotion-and-movement/muscle/ (text, not video)

This is an example of a smooth muscle cell:

Watch “Tissues, Part 1: Crash Course A&P #2” https://www.youtube.com/watch?v=i5tR3csCWYo and “Body Tissues | Four Types” https://www.youtube.com/watch?v=S4jWaLuhXaY

Lesson 3

Answer Review Questions 8, 9, and 10 and Critical-Thinking Question 30 on pages 38 and 39 in the text and write the answers in your notebook.

Define the following terms and place in your notebook. Learn the terms and have someone else quiz you.

- Cell
- Organ
- Organ system
- Organism
- Tissue

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