

Anatomy & Physiology

Levels of Organization

1 Hierarchy of Organization AP.LO.1

Complexity a

- a** Describe the function of organ systems (e.g., muscular, skeletal, digestive, nervous, respiratory, reproductive, digestive). AP.LO.1.A

Complexity b

- b** Recognize the hierarchy of cellular organization (i.e., cells make tissues, tissues make organs, etc.). AP.LO.1.B

Complexity c

- c** Identify a cell. AP.LO.1.C

Learning Progression

- Name either cells or organs that are a part of the various systems of the body (e.g., cardiac cells make up the heart which are part of the circulatory system). AP.LO.1.LP.A
- Identify the functions of the body and the organs/organ systems that are responsible for that function. AP.LO.1.LP.B
- Sequence cards showing cell, tissue, organ and system into order from simplest to most complex. AP.LO.1.LP.C
- Recognize that cells can work together. AP.LO.1.LP.D
- From a group of photos, select the ones that show cells. AP.LO.1.LP.E
- Identify that cells make up the human body. AP.LO.1.LP.F
- Engage with pictures or visual models of cells, organs, and organ systems. AP.LO.1.LP.G

2 Types of Tissues AP.LO.2

Complexity a

- a** Describe the function of a particular type of tissue (e.g., muscle tissue). AP.LO.2.A

Complexity b

- b** Recognize that there are different types of tissues with different functions. AP.LO.2.B

Complexity c

- c** Identify that tissues are made of cells. AP.LO.2.C

Learning Progression

- Name either cells or organs that are a part of the various systems of the body (e.g., cardiac cells make up the heart which are part of the circulatory system). [AP.LO.2.LP.A](#)
- Look at images of various types of tissues and match them to organs where possible (e.g., cardiac and smooth tissue). [AP.LO.2.LP.B](#)
- Match types of tissues to their function. [AP.LO.2.LP.C](#)
- Match pictures of cell types to their related tissue. [AP.LO.2.LP.D](#)
- Identify that tissues are made of cells. [AP.LO.2.LP.E](#)
- Engage with visuals showing the composition of various types of tissues (e.g., many skin cells make up skin tissue). [AP.LO.2.LP.F](#)
- Engage with models of cells. [AP.LO.2.LP.G](#)

3 Homeostasis [AP.LO.3](#)

Complexity a

- a** Describe how the body works to maintain homeostasis (e.g., sweating when the body is hot). [AP.LO.3.A](#)

Complexity b

- b** Recognize that the body's systems interact to maintain balance. [AP.LO.3.B](#)

Complexity c

- c** Identify that the body has many systems that work together. [AP.LO.3.C](#)

Learning Progression

- Recognize that different parts of the body work together to maintain homeostasis (e.g., circulatory system works to support many systems, . increased heart rate increases blood circulation which imports and exports materials as needed to maintain a healthy range). [AP.LO.3.LP.A](#)
- Recognize that if sweating increases, water will need to be replaced. [AP.LO.3.LP.B](#)
- Recognize that if more water is consumed, urination increases. [AP.LO.3.LP.C](#)
- Identify why you drink more water when consuming salty foods.. [AP.LO.3.LP.D](#)
- Compare heart rate and breathing when sitting versus running. Discuss why there is a difference. [AP.LO.3.LP.E](#)
- Describe why you start to sweat or to shake, recognize these are your body trying return to its proper balance. [AP.LO.3.LP.F](#)
- Describe a time when you had a fever, use this to understand that the body needs to stay at a certain temperature range. [AP.LO.3.LP.G](#)
- Actively participate in discussion of body functions including purpose of sweating, shivering, and why heart rate may increase. [AP.LO.3.LP.H](#)

4 Anatomical Terminology [AP.LO.4](#)

Complexity a

a Label organs on a model or image of a body. [AP.LO.4.A](#)

Complexity b

b Match organ names to a model or image. [AP.LO.4.B](#)

Complexity c

c Locate a body part on a model or image of a body. [AP.LO.4.C](#)

Learning Progression

- Identify body parts and connect to anatomical terminology. [AP.LO.4.LP.A](#)
 - Observe a labeled representation of a body and its organs. [AP.LO.4.LP.B](#)
 - Recognize that the human body has universal terminology for orientation. [AP.LO.4.LP.C](#)
 - Engage with a model of the human body (torso, internal organs). [AP.LO.4.LP.D](#)
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Support and Motion

1 Integumentary System [AP.SM.1](#)

Complexity a

a Identify the accessories of the skin system (e.g., nails, hair follicles, sweat glands). [AP.SM.1.A](#)

Complexity b

b Identify the functions of skin (e.g., protection, temperature regulation). [AP.SM.1.B](#)

Complexity c

c Identify skin as a form of protection. [AP.SM.1.C](#)

Learning Progression

- Recognize that skin aids in homeostasis. [AP.SM.1.LP.A](#)
 - Match labels to parts of the skin (e.g., hair follicles, sweat glands, nerves, blood vessels) [AP.SM.1.LP.B](#)
 - View enlarged images of the skin, see that it has layers and parts which aid in protection. [AP.SM.1.LP.C](#)
 - List or select ways your skin protects you (e.g., keeps germs out, shields the body from radiation, sweats to maintain temperature, eliminates waste products). [AP.SM.1.LP.D](#)
 - Recognize that your skin is a barrier which is protection. [AP.SM.1.LP.E](#)
 - Actively participate in discussion of characteristics of own skin. [AP.SM.1.LP.F](#)
 - Engage in touching own skin. [AP.SM.1.LP.G](#)
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2 Skeletal System [AP.SM.2](#)

Complexity a

- a** Describe the functions of the skeletal system (support, protection, movement). [AP.SM.2.A](#)

Complexity b

- b** Complete a model of a skeleton using the major bones of the body. [AP.SM.2.B](#)

Complexity c

- c** Match major bones with a diagram of a body (e.g., skull=head). [AP.SM.2.C](#)

Learning Progression

- List or select the functions of the skeleton (helps you move, supports the body, protects organs). [AP.SM.2.LP.A](#)
- Create a model of a skeleton using the major bones of the body. [AP.SM.2.LP.B](#)
- Match body parts with the bones that are associated with them (head/skull, long bone/extremities, rib cage/chest, tiny bones/fingers and toes) [AP.SM.2.LP.C](#)
- Recognize that bones in different parts of the body look different to provide different functions (primarily support). [AP.SM.2.LP.D](#)
- Engage with a visual model of the skeletal system. [AP.SM.2.LP.E](#)

3 Muscular System [AP.SM.3](#)

Complexity a

- a** Describe how muscles are needed for movement. [AP.SM.3.A](#)

Complexity b

- b** Recognize that some muscle movements are voluntary (e.g., walking) and some are involuntary (e.g., beating heart). [AP.SM.3.B](#)

Complexity c

- c** Identify a muscle. [AP.SM.3.C](#)

Learning Progression

- Bend your arm and leg in and out, notice that voluntary muscles often work in pairs. One muscle relaxes and the other contracts. **AP.SM.3.LP.A**
- Sort muscles as voluntary or involuntary based on function. **AP.SM.3.LP.B**
- Identify the location of muscles that work involuntarily (e.g., heart, blood vessels, digestive system). **AP.SM.3.LP.C**
- Recognize that some muscles move on their own (e.g., involuntary). **AP.SM.3.LP.D**
- Recognize that different muscles types provide different functions (e.g., smooth muscles for digestion, striated muscles for walking, cardiac muscle for heartbeat). **AP.SM.3.LP.E**
- Recognize the substance underneath the skin is muscle and t. That muscles areis attached to the bones of the skeletal system. **AP.SM.3.LP.F**
- Engage with pictures of the muscular system (e.g., look at pictures of different muscle types (cardiac, smooth, skeletal)). **AP.SM.3.LP.G**
- Engage in moving parts of the body and feeling muscular structures underneath skin. **AP.SM.3.LP.H**

Integration and Coordination

1 Nervous System **AP.IC.1**

Complexity a

- a** Explain how the nervous system controls all of the functions of the body and that it is made up of the brain, spinal cord, and nerves of the body. **AP.IC.1.A**

Complexity b

- b** Identify a function of the nervous system (e.g., muscle control, memory, sensory perception, emotions, speech, balance, and basic life functions like breathing). **AP.IC.1.B**

Complexity c

- c** Identify that the nervous system consists of the brain, spinal cord, and nerves. **AP.IC.1.C**

Learning Progression

- Communicate about something that happened to you in the past, explain that your brain stored that memory. **AP.IC.1.LP.A**
- Sort actions into things your body does automatically (e.g., breathe, digest) and things you have to think about (e.g., roll over, throw a ball). **AP.IC.1.LP.B**
- Recognize that the brain coordinates all the parts and functions of the body. **AP.IC.1.LP.C**
- Identify the skull as what protects your brain and describe injuries that could affect your skull/brain (e.g., concussion from sports, car accident, riding bike without a helmet, diving into shallow water). **AP.IC.1.LP.D**
- Identify where in the body your brain is located. **AP.IC.1.LP.E**
- Recognize a picture of the brain. **AP.IC.1.LP.F**
- Engage with a model of a brain or pictures of the brain, spinal cord, and nerves. **AP.IC.1.LP.G**

2 Special Senses (Sense of Sight, Senses of Hearing and Balance, Senses of Taste and Smell) **AP.IC.2**

Complexity a

- a** Explain the connection between the senses and involuntary reactions. **AP.IC.2.A**

Complexity b

- b** Match each of the five senses to descriptions or images of activities that involve the senses. **AP.IC.2.B**

Complexity c

- c** Identify each of the 5 senses using diagrams or pictures (e.g., sight = eyes). **AP.IC.2.C**

Learning Progression

- Recognize that some actions and/or events can cause involuntary reactions. (e.g., cutting onions makes your eyes water). **AP.IC.2.LP.A**
- Match the body organs that are responsible for what you smelled, touched, heard or saw. **AP.IC.2.LP.B**
- Describe how you feel or react to items when you smell, touch, listen to, look at, taste them. **AP.IC.2.LP.C**
- Smell, touch, listen to, look at, taste various items and compare similarities and differences for each. **AP.IC.2.LP.D**
- Identify the five senses. **AP.IC.2.LP.E**
- Match each sense with a body part. (e.g., sight = eyes). **AP.IC.2.LP.F**
- Smell, touch, listen to, look at, taste various items. **AP.IC.2.LP.G**

3 Endocrine System **AP.IC.3**

Complexity a

- a** Recognize that imbalances in the body can lead to diseases (e.g., high blood pressure, diabetes). **AP.IC.3.A**

Complexity b

- b** Identify functions of hormones (maintains blood glucose levels, stable blood pressure, body temperature, reproduction). **AP.IC.3.B**

Complexity c

- c** Identify that the body produces substances to help bodies grow and develop. **AP.IC.3.C**

Learning Progression

- Recognize that imbalances in the body can lead to diseases (e.g., uUse diabetes as an example for a disease that occurs when hormones are imbalanced). **AP.IC.3.LP.A**
- Recognize that hormones (chemicals) help to promote growth in the body and regulate numerous body functions. **AP.IC.3.LP.B**
- Recognize that hormones regulate body functions from birth to death. **AP.IC.3.LP.C**
- Identify hormones as substances that affect growth, development, and maintenance. **AP.IC.3.LP.D**
- Actively participate in a discussion on growing and developing. **AP.IC.3.LP.E**

Transport

1 Blood **AP.T.1**

Complexity a

- a** Describe the specific functions of red blood cells and white blood cells. **AP.T.1.A**

Complexity b

- b** Describe the function of blood in the human body (e.g., transportation, protection, and regulation). **AP.T.1.B**

Complexity c

- c** Identify the two types of blood cells (e.g., red and white blood cells). **AP.T.1.C**

Learning Progression

- Identify that white blood cells fight infection. [AP.T.1.LP.A](#)
 - Identify that red blood cells carry oxygen to the entire body and picks up carbon dioxide to transport back to the lungs. [AP.T.1.LP.B](#)
 - List or select functions of blood (e.g., carry food, oxygen and wastes, fight infection, maintain balance (homeostasis)). [AP.T.1.LP.C](#)
 - Observe pictures of red and white blood cells, describe differences in their shapes. [AP.T.1.LP.D](#)
 - Recognize that there are three different types of blood cells (e.g., red and white, platelets). [AP.T.1.LP.E](#)
 - Engage in representations of the various components of blood (e.g., red and white blood cells, platelets, plasma, etc.). [AP.T.1.LP.F](#)
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2 Cardiovascular System [AP.T.2](#)

Complexity a

- a** Describe the structure and function of the heart. [AP.T.2.A](#)

Complexity b

- b** Identify the heart as a muscle that pumps blood throughout the body. [AP.T.2.B](#)

Complexity c

- c** Locate the heart on a diagram/picture. [AP.T.2.C](#)

Learning Progression

- Label a representation of the heart including the chambers. [AP.T.2.LP.A](#)
 - Relate the cardiovascular system to a delivery system, Blood picks up products and wastes and delivers it to other systems in the body. [AP.T.2.LP.B](#)
 - Trace the flow of blood through the heart. [AP.T.2.LP.C](#)
 - Use an ECG/EKG printout to provide a visual representation of a heartbeat. [AP.T.2.LP.D](#)
 - Recognize the heart is a muscle that pumps blood throughout the body. [AP.T.2.LP.E](#)
 - Identify the heart when presented with a diagram or picture. [AP.T.2.LP.F](#)
 - Engage by placing your hand on your heart to feel your heartbeat. [AP.T.2.LP.G](#)
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3 Lymphatic and Immune Systems [AP.T.3](#)

Complexity a

- a** Describe the role of the immune system in fighting disease. [AP.T.3.A](#)

Complexity b

- b** Identify white blood cells as part of the immune system. [AP.T.3.B](#)

Complexity c

c Identify a white blood cell. **AP.T.3.C**

Learning Progression

- Describe the role of the immune system in fighting disease. Relate the immune system to a security system of a house. It constantly monitors the body looking for intruders. Once an intruder is detected, it remembers the intruder and launches a defense each and every time it is encountered. **AP.T.3.LP.A**
- Recognize that white blood cells are part of the immune system. **AP.T.3.LP.B**
- Identify a white blood cell. **AP.T.3.LP.C**
- Recognize that your body uses certain internal structures to fight off diseases when you get sick. **AP.T.3.LP.D**
- Actively participate in discussion on how the body fights illness. **AP.T.3.LP.E**

Absorption and Excretion

1 Digestive System **AP.AE.1**

Complexity a

- a** Explain how the digestive system functions to allow humans to receive nutrients needed to survive. **AP.AE.1.A**

Complexity b

- b** Identify structures used in digestion (e.g., mouth, teeth, tongue, esophagus, stomach, small intestine, large intestine, and rectum). **AP.AE.1.B**

Complexity c

- c** Identify a digestive organ in a model or diagram of the body. **AP.AE.1.C**

Learning Progression

- Recognize that as food travels, nutrients and minerals are absorbed in through the intestines back into the body. **AP.AE.1.LP.A**
- Recognize that the stomach breaks food down for digestion. **AP.AE.1.LP.B**
- Using a visual, trace what happens to food after it is consumed (e.g., from the esophagus it travels to the stomach, small and large intestine and out the rectum). **AP.AE.1.LP.C**
- Consume a cracker and document what the mouth does (e.g., teeth chew, saliva increases, tongue pushes food around and back into the esophagus). **AP.AE.1.LP.D**
- Identify the body parts in the mouth (e.g., tongue, teeth, salivary glands). **AP.AE.1.LP.E**
- Identify a digestive organ in a model or diagram in the body. (e.g., mouth, teeth, tongue, esophagus, stomach, small intestine, large intestine, and rectum). **AP.AE.1.LP.F**
- Recognize that specific organs are responsible for digesting food. **AP.AE.1.LP.G**
- Actively participate in discussion about the path your food takes as you eat. **AP.AE.1.LP.H**

2 Respiratory System **AP.AE.2**

Complexity a

- a** Describe how the respiratory system can be damaged by disease or pollutants. **AP.AE.2.A**

Complexity b

- b** Identify that breathing is the act of taking in oxygen and expelling carbon dioxide. **AP.AE.2.B**

Complexity c

- c** Identify the lungs in a model or diagram of the body. **AP.AE.2.C**

Learning Progression

- Describe how disease and damage affect the respiratory system. **AP.AE.2.LP.A**
 - Identify things that can cause lung damage. **AP.AE.2.LP.B**
 - Recognize that damage to your lungs can make it hard to breathe. **AP.AE.2.LP.C**
 - Observe how breathing changes when exposed to different conditions. (e.g. breathing on a winter day v.s. a hot summer day, breathing after you spray body spray or hair spray). **AP.AE.2.LP.D**
 - Recognize carbon dioxide as a waste product expelled by breathing. **AP.AE.2.LP.E**
 - Recognize oxygen as the gas required for performing life functions. **AP.AE.2.LP.F**
 - Identify the gases involved in respiration (e.g., take in oxygen, expel carbon dioxide). **AP.AE.2.LP.G**
 - Recognize that your lungs help you to breathe. (e.g., breath in and out of a paper bag to watch it expand and contract). **AP.AE.2.LP.H**
 - Identify the lungs in a model or diagram of the body. **AP.AE.2.LP.I**
 - Engage in breathing exercises while using your hand to feel the movement of air from the body. **AP.AE.2.LP.J**
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3 Urinary System **AP.AE.3**

Complexity a

- a** Describe the main function of the urinary system (e.g., to excrete liquid waste). **AP.AE.3.A**

Complexity b

- b** Identify structures of the urinary system (kidneys, bladder, and urethra). **AP.AE.3.B**

Complexity c

- c** Identify the kidneys in a model or diagram of the body. **AP.AE.3.C**

Learning Progression

- Trace the path of urine through the body given a diagram. **AP.AE.3.LP.A**
 - Identify what lets you know you have to urinate. **AP.AE.3.LP.B**
 - Identify what organs are involved when urination occurs. **AP.AE.3.LP.C**
 - Use pictures to identify the kidneys. **AP.AE.3.LP.D**
 - Identify where urine originates. **AP.AE.3.LP.E**
 - Identify what urine is. **AP.AE.3.LP.F**
 - Actively participate in a discussion about what happens when you drink a lot of liquids. **AP.AE.3.LP.G**
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Complexity a

- a** Describe the function of the reproductive system (e.g., producing offspring). [AP.R.1.A](#)

Complexity b

- b** Identify structures of the reproductive system in a model or visual representation. [AP.R.1.B](#)

Complexity c

- c** Identify male and female differences. [AP.R.1.C](#)

Learning Progression

- Identify functions of reproductive body parts as they relate to being male or female. [AP.R.1.LP.A](#)
- Sort reproductive organs as male or female. [AP.R.1.LP.B](#)
- Identify the parts of your body that relate to reproduction. [AP.R.1.LP.C](#)
- Identify what about your body makes you biologically male or female. [AP.R.1.LP.D](#)
- Recognize that you are biologically male or female. [AP.R.1.LP.E](#)
- Engage with visual representations of the male and female bodies. [AP.R.1.LP.F](#)