

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, . lincreased 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

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
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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., use 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
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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

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

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
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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

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 is 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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Reproduction

1 Reproductive System AP.R.1

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