# Answer Key to the Language Skills Sections

**Chapter 1**
**Practice** *(pages 9-10)*

**Exercise 1**
*Suggested answers:*

1. The heart is formed by muscle tissues. Its function is to pump blood.
   The heart is comprised of muscle tissue. The heart's function is to pump blood.
   Muscle tissue comprises the heart. The heart has the function of pumping blood.

2. The skin is formed by epithelial tissue. Its function is to protect the body.
   The skin is comprised of epithelial tissue. The skin's function is to protect the body.
   Epithelial tissue comprises the skin. The skin has the function of protecting the body.

3. The stomach is formed by muscle tissues. Its function is to hold food.
   The stomach is comprised of muscle tissue. The stomach's function is to hold food.
   Muscle tissue comprises the stomach. The stomach has the function of holding food.

4. Muscles are formed by muscle tissues. Their function is to move the body.
   Muscles are comprised of muscle tissue. Muscles' function is to move the body.
   Muscle tissue comprises muscles. Muscles have the function of moving the body.

5. Bones are formed by bone tissues. Their function is to support the body.
   Bones are comprised of bone tissue. Bones' function is to support the body.
   Bone tissue comprises bones. Bones have the function of supporting the body.

**Exercise 2**

1. The function of the stomach is to hold food.
2. Epithelial tissue comprises the skin.
3. The heart's function is to pump blood.
4. Muscle tissue forms the heart.

**Exercise 3**

1. The smallest building block of the body is a molecule. Molecules form cells. Cells form tissue. Tissue forms organs. Organs form organ systems.

2. A cell is comprised of many parts. The “skin” of the cell is the membrane. Its function is to regulate the cell’s contents. Nutrients for the cell and wastes that the cell produces pass easily through the membrane. Inside of the cell there is cytoplasm. The function of cytoplasm is to hold the cell parts in place. The nucleus is an important part of the cell. It is the brain of the cell. It tells the cell what to do. It contains DNA which is genetic material. Also inside of the cell are cell parts called organelles. They carry out basic functions for the cell’s survival.

**Chapter 2**
**Practice** *(pages 23-24)*

**Exercise 1**
*Suggested answers:*

What does the word adipose mean?
Could you explain to me how someone gets a blister?
Could you tell me the function of collagen?
Can you tell me what keratin does?
What does UV mean in the term UV rays?

**Exercise 2**
*Answers will vary.*

**Exercise 3**
*Suggested answer:*

Dear Mrs. Chu,

Thank you for spending time with me yesterday. I read pages 18-23 like you asked me to do. I understand everything in those pages except for two words. The words are: *resident* as in *resident bacteria* and *concentrated* as in *where melanin is concentrated*. If you could please explain those words to me after class today I'd really appreciate it.

Sincerely,
Agnes

**Chapter 3**
**Practice** *(pages 41-42)*

**Exercise 1**
*Suggested answers:*

1. I'm not sure where calcitonin is secreted.
2. I understand the difference between how a long bone and a flat bone are organized.
3. I think I understand what causes osteoporosis.
4. I'm not sure what the function of bone marrow is.
5. I understand how hard matrix is.

**Exercise 2**
*Suggested answer:*

Dear Mrs. Chu,

I hope this note finds you well. I read pages 35-37 like you asked me to do. I completely understand how bone tissue is organized, the two ways bone tissue can appear and the difference between how compact and spongy bone are arranged in a flat bone and in a long bone. However, there are two things that I don't understand from this reading. First, I'm not sure why a long bone has a marrow cavity. How did it get there? Next, I don't understand how the outer covering of bone can be so hard when it's comprised of connective tissue. To me, bone seems to be too hard to be comprised of tissue of any kind. Thank you in advance for explaining to me the things I don't understand. I really appreciate it.

Sincerely,
Agnes

**Chapter 4**
**Practice** *(pages 77-78)*

**Exercise 1**
Examples of how students would talk about the muscle location are located in the language box on the top of page 78.

**Exercise 2**
*Answers will vary.*

**Exercise 3**

1. The frontalis muscle is located beneath the frontalis bone.
2. The tibialis anterior muscle is located on the front of each tibia.
3. The trapezius muscle extends from the backbone to the shoulders.
4. The biceps brachii muscle extends from the shoulder to the inside of the elbow.
5. The sternocleidomastoid muscle extends from the sternum to the temporal bone.

**Chapter 5**
**Practice** *(pages 93-94)*

**Exercise 1**

The correct sequence is: 5, 2, 6, 4, 1, 3

*A suggested way of sequencing the steps*:

First sodium and potassium move in and out of the neuron. Then an electrical current forms. After the current is formed, it is sent to the end of the axon. At the end of the axon, the electrical current stimulates the vesicles. When stimulated the vesicles release neurotransmitter. After neurotransmitter is released, it jumps across the synapse and attaches to the receptor molecules of the next neuron.

**Exercise 2**
*See page 93 for correct sequence.*

**Exercise 3**
*Answers will vary.*

**Exercise 4**

1. After an electrical current reaches the end of the axon, it stimulates the vesicles.
2. After the spinal cord makes a reflex decision, a message is sent along a neuron to an organ.
3. The first step in a reflex pathway is sensing a stimulus.
4. The steps in a reflex pathway are: (see page 93)

**Chapter 6**
**Practice** *(pages 118-120)*

**Exercise 1**
*Suggested answers:*

1. How does the limbic system differ from the reticular formation?
2. What is the difference between white matter and gray matter?
3. How is conscious thought different from subconscious thought?
4. How does the frontal lobe differ from the temporal lobe?
5. Are there any differences between the thalamus and the hypothalamus?
6. What are the different functions of the parietal lobe and the frontal lobe?

**Exercise 2**

1. The cerebrum and cerebellum differ with respect to body movement. The cerebrum contains the frontal lobe which makes the decision for the skeletal muscles to move. However, it does so only after it has received messages from the cerebellum about the position of skeletal muscles. This information from the cerebellum helps to make sure the movements are coordinated.

2. The spinal cord and the midbrain are both important in reflex control. However, the midbrain is only in charge of reflexes related to things that happen in the head, such as blinking or moving the head suddenly. The spinal cord is in charge of all other kinds of reflexes.

**Chapter 7**
**Practice** *(pages 140-141)*

**Exercise 1**

2. The irritation in the stomach leads to secretion of more acid than normal and as a result, a stomach lesion appears.
3. When you smell or think about food, salivary glands secrete saliva.
4. Taste buds are located on your tongue, so you can taste food.
5. Saliva liquefies food. Consequently, food molecules are dissolved.
6. The gastroesophageal sphincter closes, so the food can't be pushed back upward into the esophagus.
7. Sometimes your wisdom teeth grow under one of the molars, causing pain; therefore, the dentist has to remove your wisdom teeth.
8. There isn't enough alkaline mucus in the stomach. For this reason, the stomach lining is damaged by too much acid.

**Exercise 2**

1. Cavities occur when you don't brush your teeth frequently. The bacteria eat away at the tooth and as a result a cavity forms.
2. People get peptic ulcers as a result of a bacterium living in the stomach.
3. Peristalsis occurs when the esophagus senses the food in it.

**Chapter 8**
**Practice** *(pages 162-164)*

**Exercise 1**

2. Lymphocytes white blood cells produce antibodies
3. lyphocytic leukemia disorder too many white blood cells
4. bacteria microorganisms can cause an infection
5. plasma a part of blood contains water and molecules such as sugar, hormones and salts

Definitions

2. Lymphocytes are white blood cells that produce antibodies.
3. Lympocytic leukemia is a disorder that occurs when there are too many white blood cells.
4. Bacteria are microorganisms that can cause an infection.
5. Plasma is a part of blood that contains water and molecules such as sugar, hormones and salts

**Exercise 2**

1. Good
2. Not good. It should be: A pathogen is a microorganism that causes diseases.
3. Not good. It should be: A virus is a microorganism that has no organelles.
4. Good
5. Not good. It should be: Platelets are parts of blood that play an important role in stopping bleeding.

**Exercise 3**

a. Hemophilia is an inherited disease in which the blood lacks the ability to coagulate. Therefore, if these people are injured, it is hard for their body to stop the bleeding.
b. Leukemia is a cancer of the white blood cells in which leukocytes multiply in an uncontrollable way.
c. A neutrophil is a white blood cell that “eats” microorganisms and other foreign substances in the blood.

**Chapter 9**
**Practice** *(pages 195-196)*

**Exercise 1**
*Suggested answers:*

1. Blood volume influences blood pressure.
2. The SA node is responsible for conduction in the heart.
3. Plasma is a component of blood.
4. Platelets, leukocytes, and erythrocytes are components of blood.
5. A stenotic valve causes a heart murmur.

**Exercise 2**
*Suggested answers:*

1. Exercise and stress increase heart rate.
2. The pericardium covers the heart.
3. The heart rate increases due to caffeine and nicotine.
4. Baroreceptors monitor blood pressure.
5. The amount of blood in the blood vessels influences blood pressure.

**Exercise 3**

1. Blood volume is related to blood pressure. If blood volume is too high, blood pressure becomes high. Likewise, if blood volume is too low, blood pressure becomes low.

2. The conduction system of the heart is comprised of special cardiac muscle fibers.

3. The circulation of blood is related to heart attacks. If there is a blockage of one of the coronary arteries, a heart muscle might be denied nutrients. As a result, the heart muscle might die. If part of the heart muscle is dead the heart can't pump blood as well. This leads to a heart attack.

**Chapter 10**
**Practice** *(pages 221-223)*

**Exercise 1**

1. A
2. A
3. P
4. P
5. A

**Exercise 2**

1. is taken
2. is called
3. is controlled
4. sends
5. separates
6. is stimulated
7. cause
8. are attached
9. move
10. expand

**Exercise 3**

1. Lung cancer can be caused by smoking tobacco.
2. Your lungs are filled with about 150 million alveoli.
3. Carbon dioxide is brought to the alveoli by capillaries.
4. Premature babies are placed on respirators to help them breathe.
5. Surfactant is produced in the walls of alveoli by large round cells.

**Exercise 4**

1. Air is inspired through the nose and travels down the trachea to the lungs. In the lungs it enters primary bronchi. There is one primary bronchus in each lung. From there the air is carried through secondary bronchi, tertiary bronchi, bronchioles and finally reaches the alveoli where gas exchange takes place.

2. Inspiration is controlled by the brain. It occurs when a message is sent to the diaphragm telling it to contract. At the same time the diaphragm is stimulated, the intercostals muscles are also stimulated and the rib cage goes up and out. Both of

these contractions cause the thoracic cavity to expand. The lungs are attached to the wall of the thoracic cavity, so as it expands so do the lungs. When the lungs expand, the pressure in them decreases to be less than the air pressure outside. Air naturally flows from high pressure areas to low pressure areas so this cause the air to fill with lungs.

3. When air leaves the lungs it is called expiration. When air is about to be expired, the diaphragm and intercostals muscles relax. This causes the rib cage to go down and in and the thoracic cavity to become smaller. When the thoracic cavity becomes smaller, so do the lungs. Because the air pressures increases in the lungs at this time, to maintain equality with the air pressure outside the lungs, the air in the lungs is forced out.

4. Gas exchange occurs in the lungs by a process called diffusion. This means that molecules that are separated by a membrane are more likely to move toward the area with fewer molecules. For example, there is less oxygen in capillaries in the lungs than in the alveoli. Oxygen diffuses into the capillaries. On the other hand, carbon dioxide is diffused in the other direction.

**Chapter 11**
**Practice** *(pages 241-242)*

**Exercise 1**
*Suggested answers:*

1. What happens if a person has only 500,000 nephrons in each kidney?
2. I wonder if molecules pass through the glomeruli one at a time or a whole bunch pass through at the same time.
3. I wonder what happens if too much water is returned to the blood.
4. I wonder why so many people in developed countries have diabetes.
5. What would happen if urine got into a person's cut? Would it cause an infection?
6. What might happen if a person didn't have enough erythropoietin?
7. I wonder what would happen if a person didn't produce enough aldosterone.

**Exercise 2**
*Answers will vary.*

**Exercise 3**

1. If a person lost a lot of blood in a car accident, their blood pressure decreased. When blood pressure decreases, filtration also decreases.

2. The kidneys could be more easily damaged if a person lost all of the fat around the kidneys. The fat protects the kidneys from damage.

3. If a person lost half of his nephrons, the blood couldn't be filtered very well. This might lead to accumulation of toxins in the blood.
4. The transplanted kidney would be rejected by the body if it didn't match the recipient's tissue.

5. If a large kidney stone blocked each ureter, the urine would back up into the kidney. This would cause filtration to stop and lead to kidney failure. Also, this condition would be quite painful and the person wouldn't be able to urinate.

**Chapter 12**
**Practice** *(pages 259-261)*

**Exercise 1**
*Suggested answers:*

| | |
|---|---|
| Identify the situation. | A man has to have his prostate removed. |
| Define the terms. | Prostate—a gland that adds milky fluid to the semen. This milky fluid helps the semen coagulate inside the woman and also kills bacteria. |
| Analyze the question. | How will not having a prostate affect this man's ability to reproduce? |
| Evaluate the information you need to answer the question. | I need to know the prostate's function in reproduction. |
| Hypothesize a possible answer. | Without a prostate, a man's semen will not coagulate and will probably fall out of a woman's vagina easily. It is unlikely that sperm could reach the egg, and therefore it is unlikely that he will be able to produce a child. |

| | |
|---|---|
| Restate the question | If a man has to have his prostate removed it will affect his reproductive function. |
| Define necessary terms | Prostate—a gland that adds milky fluid to the semen. This milky fluid helps the semen coagulate inside the woman and also kills bacteria. |
| Develop an answer | If a man has to have his prostate removed it will affect his reproductive function. The prostate is a gland that adds milky fluid to the semen. This milky fluid helps the semen coagulate inside the woman and also kills bacteria. If a man doesn't have a prostate, his semen will be too thin and will likely fall out of a woman's vagina, so it will be unlikely that any sperm will be able to fertilize the egg. |

**Exercise 2**

1. Mary, a 42 year old woman is has been trying to get pregnant for six months. It is usually more difficult for older women to get pregnant than younger women. In addition, her husband John has hypertension. Hypertension is often caused by plaque in the arteries. Plaque in the arteries is one cause of impotence, the inability to get or maintain an erection. Therefore, for the two reasons Mary might not be getting pregnant are her age and that her husband is having a hard time maintaining an erection, and therefore cannot deposit sperm as easily.

2. If a man has a low sperm count, sperm production can be stimulated. It can be stimulated by giving him extra FSH, which gets the testes ready to produce sperm, and LH, which is responsible for telling the testes to make testosterone. Or, he could be given extra testosterone, which would also increase sperm production. When there is an increase in these hormones in the man's body, his sperm count will rise.