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## Homeostasis: Organ Systems Working Together

Directions: Use and integrate information and evidence from the coloring book reading and readings provided to answer the following questions.

### Gas Exchange

The respiratory system consists of the lungs and other structures which provide for the exchange of oxygen and carbon dioxide between the blood and the external environment. Passageways, which become smaller and smaller in the lungs come to “dead-ends” known as alveoli. Alveoli are surrounded by capillaries. These thin-walled vessels allow for the diffusion of gases in and out of the blood.

1. Describe how the respiratory system and the circulatory system work together in order to provide oxygen to the body cells and remove carbon dioxide for the blood.

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### Providing Nutrients

The digestive system functions to break down food into small and simple nutrients that can be used by the body of the cells. Mechanical and chemical digestion complete this through different structures of the digestive system, including the mouth, stomach and small intestines. The small intestines is lined with tiny projections known as villi, which contain tiny vessels known as capillaries.

2. Describe how the digestive system and circulatory system work together to provide nutrients to the body cells.

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Vocabulary Sheet: Human Body Unit, Chapters B1, B2, and B3

Overview

Organ / Body Part / Term	Definition / Shape / Location / Function
Homeostasis	
Tissue	
Organ	
Organ System	
Epithelial Tissue	
Muscle Tissue	
Connective Tissue	

Excretion

The excretory system functions to eliminate wastes and other materials from the blood. The kidney is composed of many small units called nephrons which filter the blood of impurities and empties them into collecting ducts which lead to the bladder and eventual removal from the body. The lungs, part of *both* the excretory and respiratory system, eliminate carbon dioxide from the blood.

3. Describe how the circulatory system and excretory system work together to remove wastes, such as excess salts and water, urea and carbon dioxide from the body.

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## Connective Tissue

Directions: Use information and evidence from the coloring book reading to answer the following questions.

1. What are three major types of connective tissue?

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2. Circle the correct answer. Bone is **rigid/loose** connective tissue and adipose tissue is **rigid/loose** connective tissue.

3. What are three functions of adipose tissue?

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4. What are the three major types of blood cells? What are their functions?

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5. **Higher-order Thinking.** Describe the relationship between bones and blood cells.

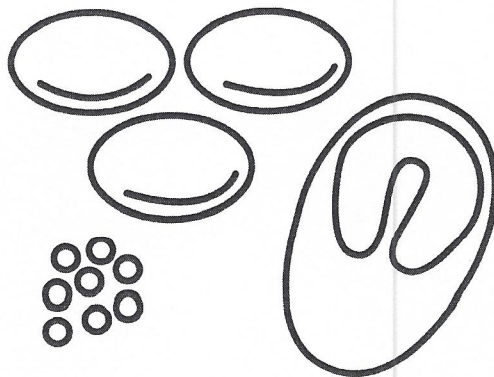
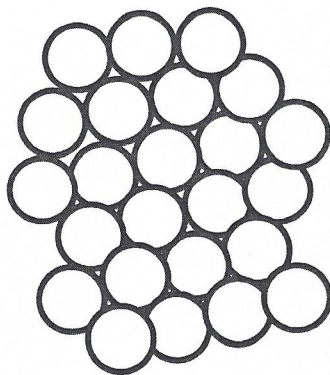
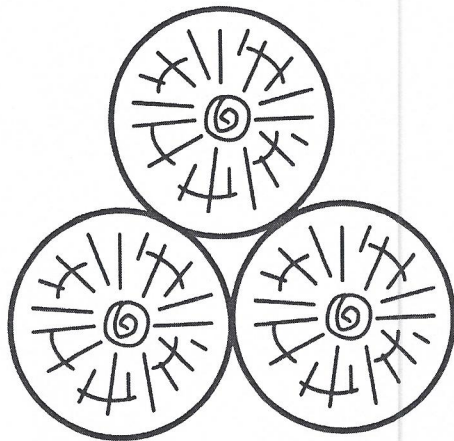
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## Connective Tissue Coloring



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### Coloring Directions:

1. Label and color the bone tissue brown.
2. Label and color the adipose (fat) tissue yellow.
3. Label and color the red blood cells red.
4. Label and color the white blood cell green.
5. Label and color the platelets violet.

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## Epithelial Tissue

Directions: Use information and evidence from the coloring book reading to answer the following questions.

1. What are four major functions of epithelial tissue?

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2. Epithelial tissue is characterized by the \_\_\_\_\_ of its cells the \_\_\_\_\_ of layers that it is composed of.

3. Describe the three basic shapes of epithelial cells.

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4. What is the difference between simple and stratified epithelium?

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5. **Higher-Order Thinking.** If the basement membrane was damaged, do you think new epithelial tissue could regrow? Explain.

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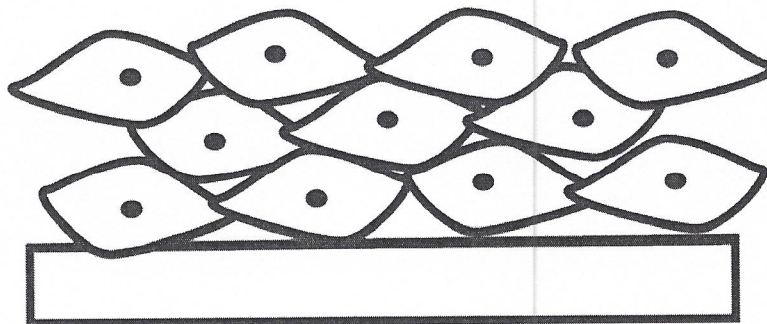
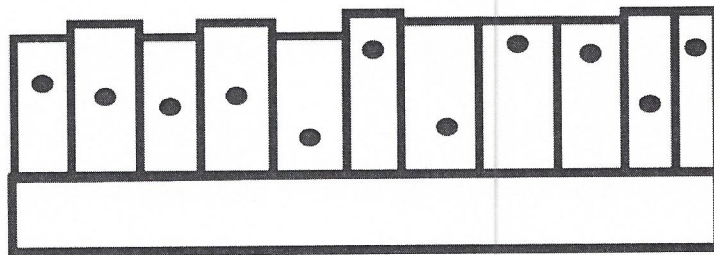
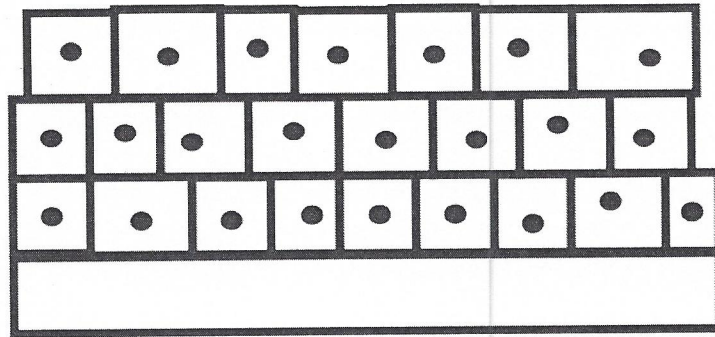
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## Epithelial Tissue Coloring



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### Coloring Directions:

1. Label and color the basement membrane blue.
2. Label and color the cuboidal cells red.
3. Label and color the columnar cells green.
4. Label and color the squamous cells orange.
5. Label each type of tissue as simple or stratified.

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## Muscular Tissue

Directions: Use information and evidence from the coloring book reading to answer the following questions.

1. What are three major types of muscle tissue?

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2. What is a common function of all the major types of muscle?

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3. Complete the Venn Diagram using the following terms:

Voluntary movement

Involuntary movement

Striated

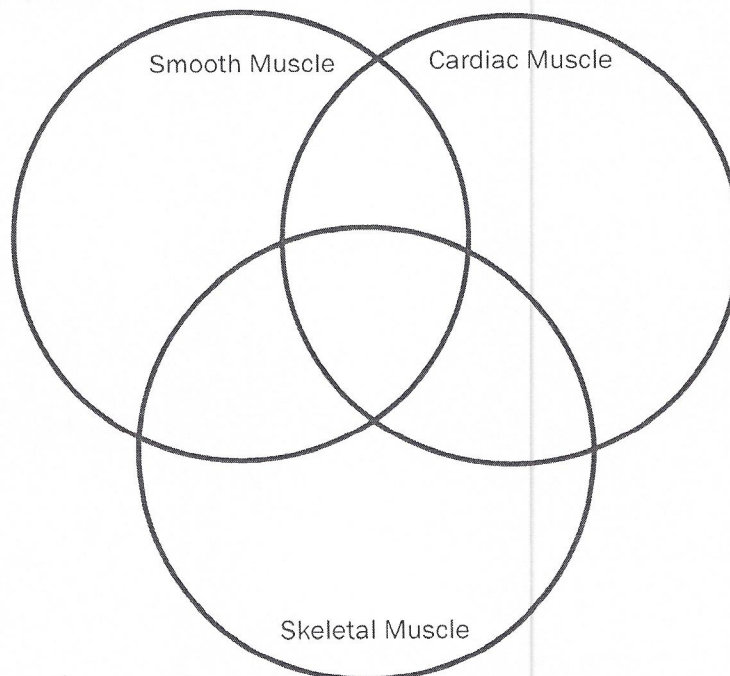
Multinucleated

Contains one nucleus

Not striated

Contains gap junctions

Found only in the heart



4. Why are gap junctions important to cardiac muscle cells?

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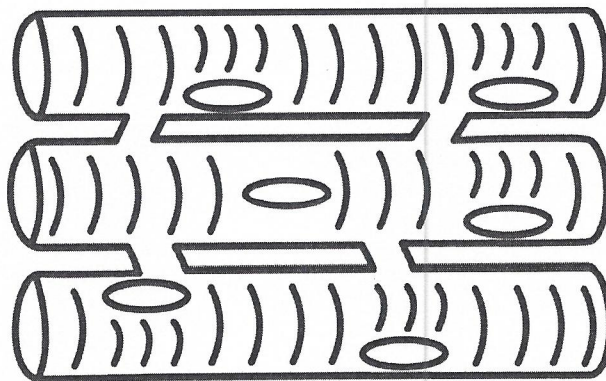
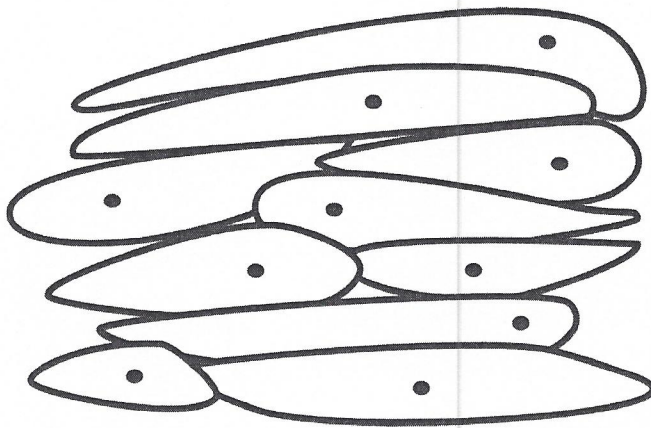
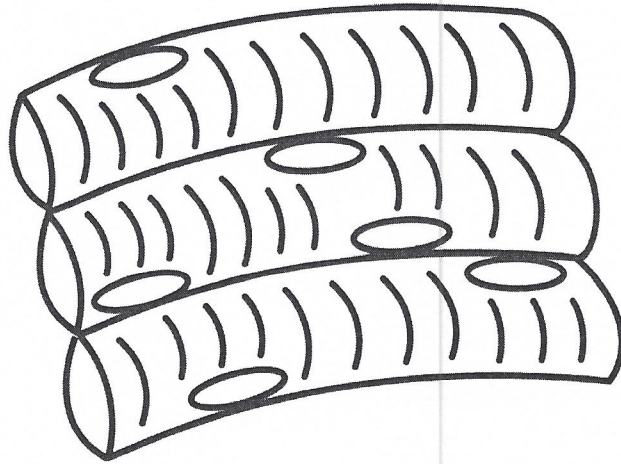
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## Muscle Tissue Coloring



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### Coloring Directions:

1. Label and color the skeletal muscle blue.
2. Label and color the smooth muscle red.
3. Label and color the cardiac muscle orange.
4. Label the gap junctions of cardiac muscle.



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## The Respiratory System

Directions: Use information and evidence from the coloring book reading to answer the following questions.

1. Circle the correct answer. The respiratory system provides **oxygen/carbon dioxide** needed for cellular respiration and removes **oxygen/carbon dioxide** from the blood.

2. What is the difference between breathing and respiration?

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3. Why do capillaries surround alveoli? Why are they well adapted for allowing gases to enter and exit the blood?

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4. Diffusion is the passive movement of molecules from areas of high concentration to low concentration. Describe how diffusion of gases takes place in the lungs using the terms: alveoli, blood, oxygen, carbon dioxide, high concentration, low concentration and diffusion.

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5. **Higher-order Thinking.** Predict what would happen if the muscles that control structures in the larynx became paralyzed.

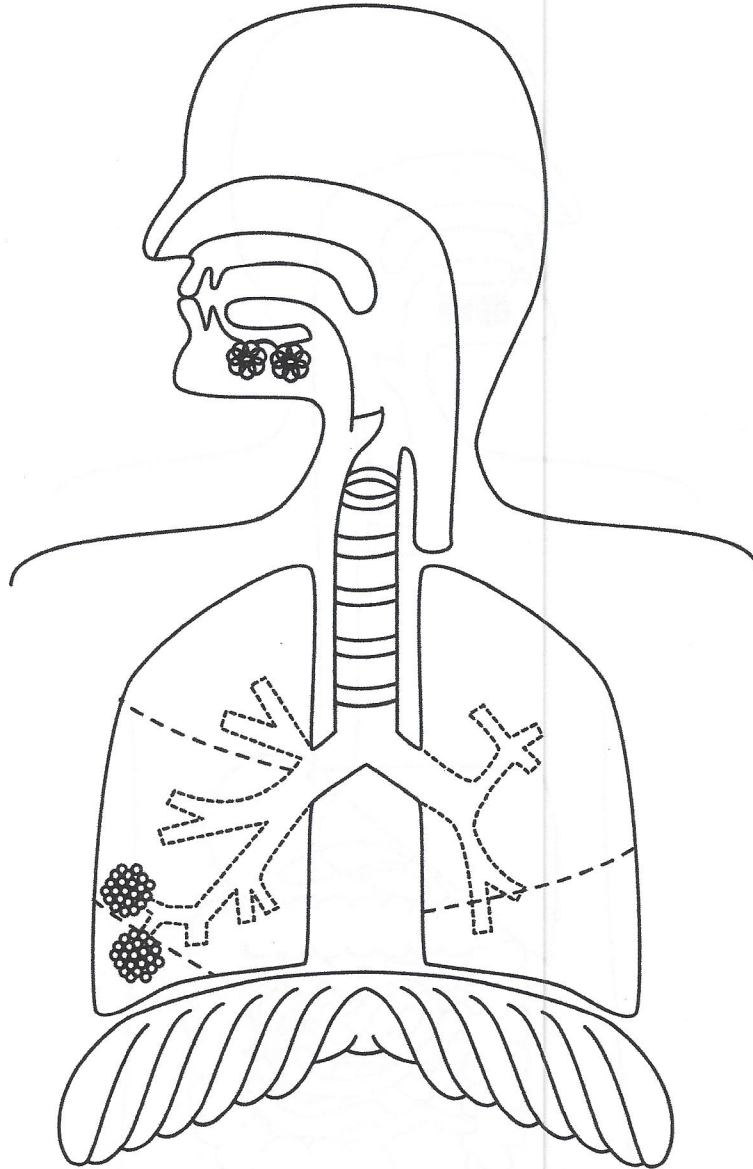
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## Respiratory System Coloring



### Coloring Directions:

1. Label and color the nasal cavity violet.
2. Label and color the mouth yellow.
3. Label and color the pharynx sky blue.
4. Label and color the epiglottis green.
5. Label and color the larynx (vocal cords) brown.
6. Label and color the trachea red.
7. Label and color the lungs light green.
8. Label and color the bronchi orange.
9. Label and color the bronchioles grey.
10. Label and color the alveoli magenta.
11. Label and color the diaphragm blue.

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## The Digestive System

**Directions:** Use information and evidence from the coloring book reading to answer the following questions.

1. What is the function of the digestive system?

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2. What is the difference between mechanical and chemical digestion?

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3. What are three functions of the pancreas?

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4. Where is bile produced? Why is bile important to fat digestion?

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5. **Higher-order Thinking.** A young man was diagnosed with a bacterial bladder infection and was prescribed antibiotics. He was told to ingest one pill every day for one week. Antibiotics are a type of medicine that kill bacteria that cause disease. *Sometimes antibiotics kill good bacteria too.* Two weeks later the young man goes back to the doctor. He cut himself accidentally and the bleeding won't stop. Why could the young man have this new problem?

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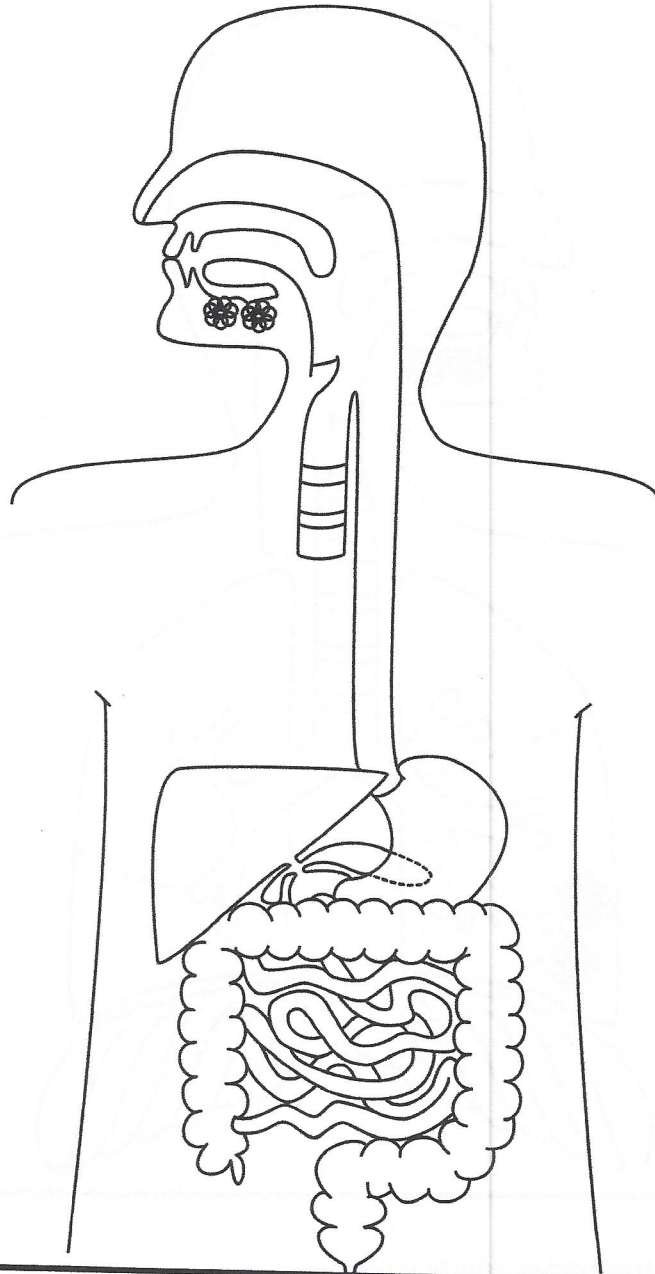
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Name: \_\_\_\_\_  
Digestive System Coloring



Coloring Directions:

1. Label and color the mouth yellow.
2. Label and color the tongue light brown.
3. Label and color the salivary glands magenta.
4. Label and color the pharynx sky blue.
5. Label and color the epiglottis green.
6. Label and color the esophagus violet.
7. Label and color the stomach red.
8. Label and color the pancreas orange.
9. Label and color the liver brown.
10. Label and color the gall bladder light green.
11. Label and color the small intestines blue.
12. Label and color the large intestines grey.
13. Label and color the appendix teal.
14. Label and color the rectum pink.

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## The Circulatory System – Vessels

**Directions:** Use information and evidence from the coloring book reading to answer the following questions.

1. What are three major functions of the circulatory system?

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2. What is the difference between pulmonary and systemic circulation?

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3. Circle the correct answer. Arteries are vessels that carry blood **towards/away from** the heart and veins carry blood **towards/away from** the heart.

4. What is unique about the pulmonary artery and pulmonary vein?

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5. Why is it important for veins to have valves?

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6. **Higher-order Thinking.** Predict what would happen if the vessels that supply blood to the heart became clogged.

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## The Circulatory System – Blood

**Directions:** Use information and evidence from the coloring book reading to answer the following questions.

1. What are the four major components of blood?

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2. What is the function of hemoglobin? Where is it found?

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3. Match each white blood cell with its description.

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|-----------------|----------------------------------|
| ___ Macrophage  | A. releases histamine            |
| ___ Mast Cells  | B. produces antibodies           |
| ___ Lymphocytes | C. engulfs and digests pathogens |

4. Compare the different ways oxygen and carbon dioxide are transported in the blood.

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5. **Higher-order Thinking.** A person has a disease that causes his platelets to not function correctly. Predict the effect this would have.

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6. **Higher-order Thinking.** A woman goes to the doctor and has a blood test. The test shows she has a low red blood cell count. Predict the symptoms that prompted her to go to the doctor.

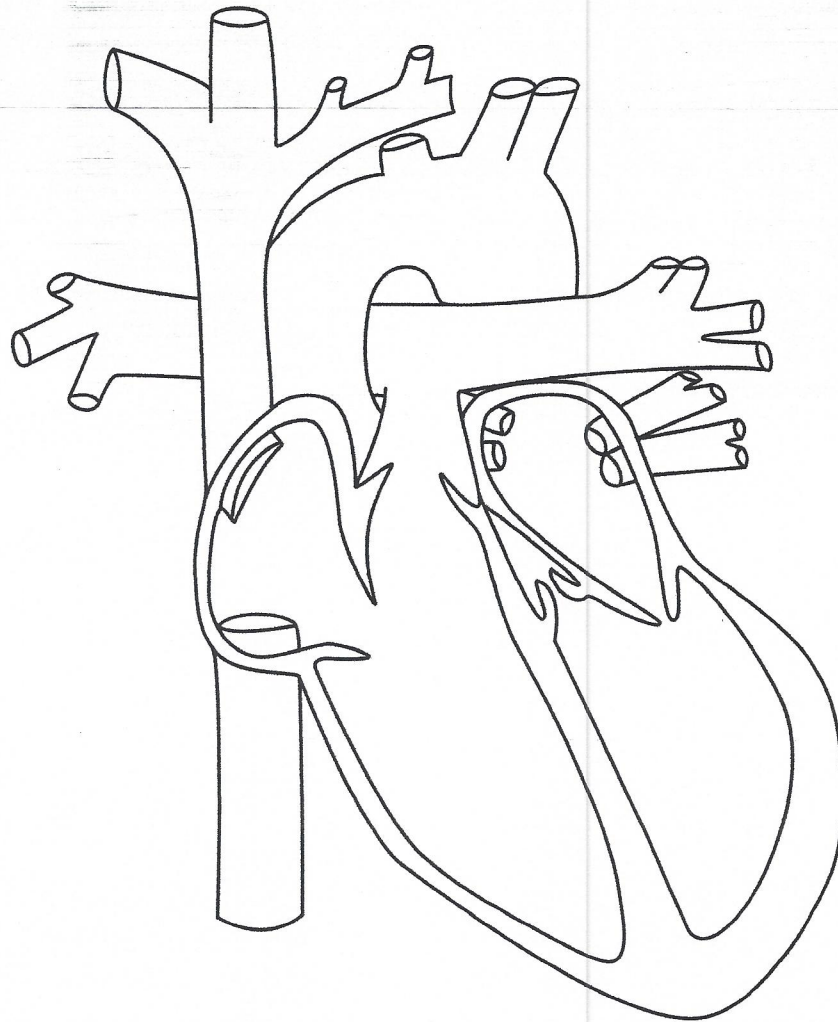
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## The Heart Coloring Activity



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### Coloring Directions:

1. Label and color the superior vena cava blue.
2. Label and color the inferior vena cava blue.
3. Label and color the right atrium violet.
4. Label and color the right ventricle brown.
5. Label and color the pulmonary artery sky blue.
6. Label and color the pulmonary vein pink.
7. Label and color the left atrium orange.
8. Label and color the left ventricle yellow.
9. Label and color the aorta red.
10. Label and color the tricuspid valve grey.
11. Label and color the pulmonary valve teal.
12. Label and color the mitral valve green.
13. Label and color the aortic valve magenta.
14. Label and color the septum tan.
15. Draw arrows showing the direction of blood flow through the heart.

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## The Circulatory System - Heart

**Directions:** Use information and evidence from the coloring book reading to answer the following questions

1. What is the function of the heart?

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2. What is the function of valves in the heart?

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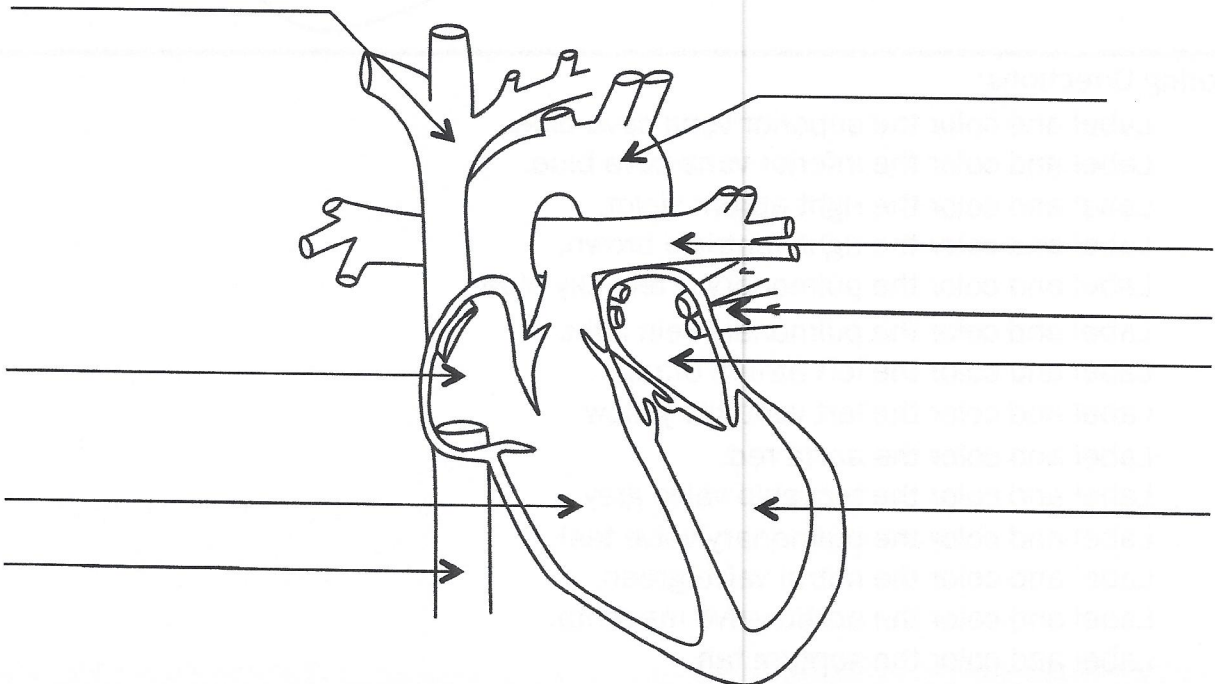
3. Why does the left ventricle have a thicker layer of muscle than the right ventricle?

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4. Label the major vessels and chambers of the heart in the diagram below.





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## The Urinary System

**Directions:** Use information and evidence from the coloring book reading to answer the following questions.

1. What is the function of the urinary system?

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2. The *excretory system* includes organs and structures of the urinary system as well as the skin and lungs. Why are the lungs considered an organ of the excretory system?

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3. What materials in the blood are filtered by the nephron?

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4. What is the difference between the ureters and urethra?

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5. **Higher-order Thinking.** A negative feedback mechanism occurs when an increase in a substance feeds back to inhibit the process that produced the substance in the first place. Describe how dehydration, ADH and thirst play a role in the feedback mechanism that controls water balance in the human body.

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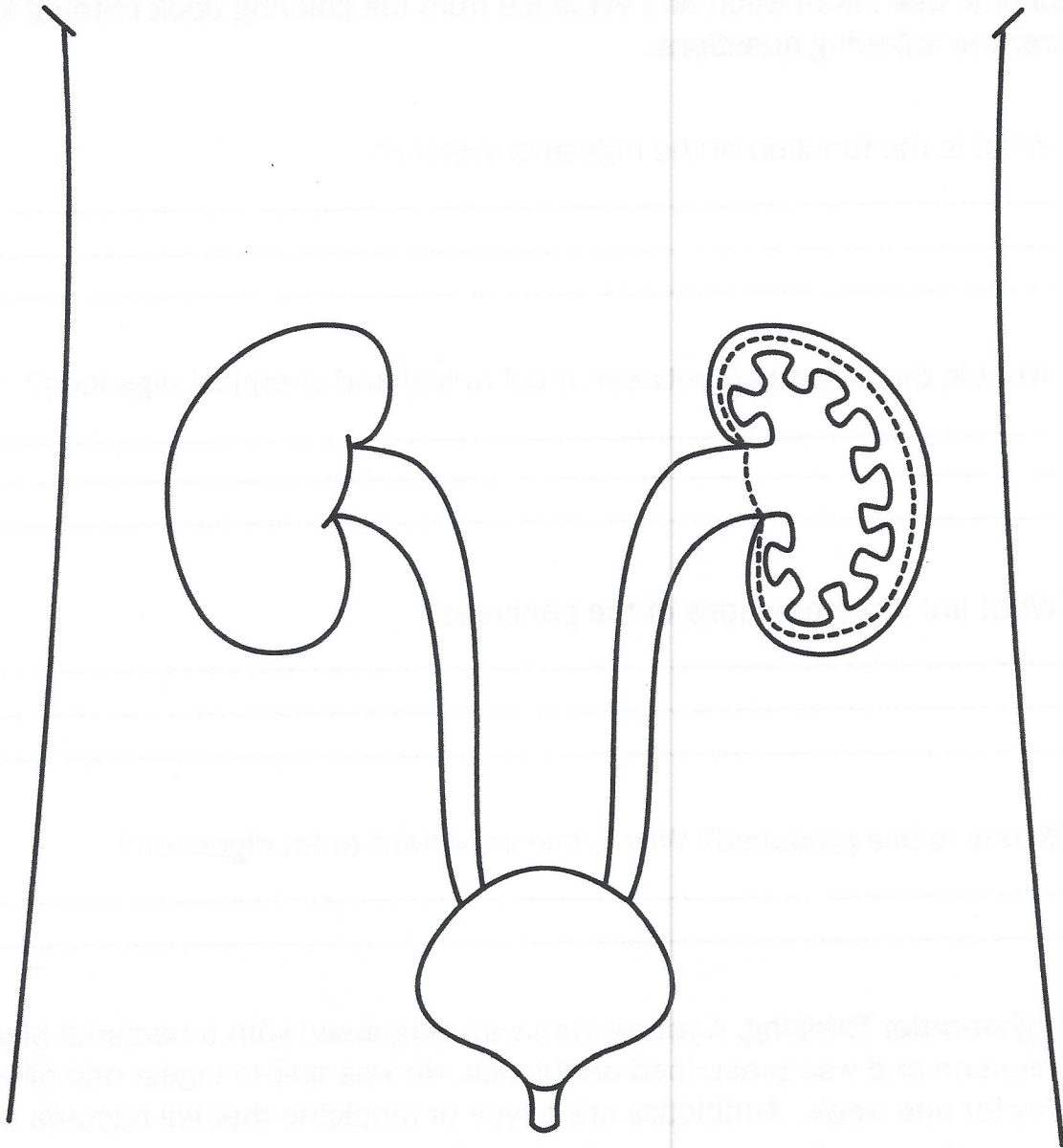
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## Urinary System Coloring



### Coloring Directions:

1. Label and color the kidney orange.
2. Label and color the cortex of the kidney yellow.
3. Label and color the medulla of the kidney pink.
4. Label and color the ureters blue.
5. Label and color the bladder green.
6. Label and color the urethra red.