Chapter 2 Notes: Human Body Systems

Name: ____________________
Block: ___________
Human Body Systems

Characteristics of Systems:
1. A system is made of individual parts that work together as a ____________.
2. A system is usually ____________ to one or more systems.
3. If one part of a system is missing or ______________, the system will not function well or may not function at all.

The Eleven Human Body Systems:

<table>
<thead>
<tr>
<th>1) Integumentary System –</th>
<th>2) Nervous System –</th>
<th>3) Skeletal System –</th>
</tr>
</thead>
<tbody>
<tr>
<td>Includes skin, hair, and nails. Creates a waterproof protective ____________ around the body.</td>
<td>Detects changes in the environment and ____________ these changes to the body, which then carries out a response.</td>
<td>Supports, protects, and works with muscles to move parts of the ____________.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Manufactures and releases ____________.</td>
<td>Includes reproductive organs for producing ____________.</td>
<td>Has muscles that work with the bones to move parts of the ____________.</td>
</tr>
</tbody>
</table>

|----------------------|------------------------|-----------------------|

<table>
<thead>
<tr>
<th>10) Excretory System –</th>
<th>11) Immune System –</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removes liquid and gas ____________ from the body.</td>
<td>Defends the body against ____________.</td>
</tr>
</tbody>
</table>
### Cells, Tissues, Organs, and Organ Systems

The relationship between cells, tissues, organs, and organ systems:

<table>
<thead>
<tr>
<th>Cell</th>
<th>Tissue</th>
<th>Organ</th>
<th>Organ System</th>
<th>Organism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell - the basic unit of __________.</td>
<td>Tissue - a group of __________ that have the same structure and function.</td>
<td>Organ - a group of __________ working together to perform a task.</td>
<td>Organ System - one or more __________ that work together to perform specific body functions.</td>
<td>Organism - a __________ thing.</td>
</tr>
</tbody>
</table>

#### Types of Tissues:

<table>
<thead>
<tr>
<th>Image</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="cell.png" alt="Image" /></td>
<td>1) ____________ tissue – assists in body movements.</td>
<td></td>
</tr>
<tr>
<td><img src="tissue.png" alt="Image" /></td>
<td>2) ____________ tissue – transfers signals in the body and organs.</td>
<td></td>
</tr>
<tr>
<td><img src="organ.png" alt="Image" /></td>
<td>3) ____________ tissue – holds together and supports other tissues.</td>
<td></td>
</tr>
<tr>
<td><img src="organ_system.png" alt="Image" /></td>
<td>4) ____________ tissue – covers the surface and lines the inside of organs and body parts.</td>
<td></td>
</tr>
</tbody>
</table>
Nutrition

The four food groups:

1) ___________
2) ___________
3) ___________
4) ___________

Daily recommended servings:

How many servings per day of each food group should you eat?

1) Grain Products: ________ servings
2) Vegetables and Fruits: ________ servings
3) Milk Products: ________ servings
4) Meat and Alternatives: ________ servings

Types of Nutrients:

Nutrients are substances the body needs for energy, growth, development, repair, or maintenance.

There are six types of nutrients: 1) ____________, 2) ____________, 3) ____________, 4) ____________, 5) ____________, and 6) ____________.
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Types</th>
<th>Function</th>
</tr>
</thead>
</table>
| 1)_____ | a) simple carbohydrates are ________ sugar molecules (e.g. glucose)  
b) complex carbohydrates are ________ of simple carbohydrates (e.g. starch). | -are the body’s quickest source of ________ |
| 2)_____ | a) complete proteins have all ____ essential amino acids (e.g. meat and fish)  
b) incomplete proteins do not have all ____ essential amino acids (e.g. beans) | -used to ____________ muscles, skin, hair, and nails |
| 3)_____ | a) saturated fats are _______ at room temperature  
b) unsaturated fats are _______ at room temperature. | -build cell membranes and are _______ energy |
| 4)_____ | Vit ____ (for night vision)  
Vit ____ (for healthy teeth and bones)  
Vit ____ (for healthy muscles)  
Vit ____ (for blood clotting)  
Vit ____ (for healthy gums)  
Vit ____ (for energy production) | -help keep your ________ healthy and strong |
| 5)_____ | H₂O | -transports nutrients and ________  
-necessary for many chemical ________  
-cools the body through ________ production |
| 6)_____ | Various ________ needed in small quantities (e.g. fluorine, iron, sodium, magnesium, calcium, phosphorus, copper, potassium, sulfur) | -help keep your ________ healthy and strong |
Mineral Functions in the Body:

1) \( \text{F} \) — dental cavity reduction
2) \( \text{Fe} \) — formation of red blood cell parts; transportation of oxygen throughout the body
3) \( \text{Na} \) — nerve activity
4) \( \text{Mg} \) — muscle and nerve activity; bone formation
5) \( \text{Ca} \) — teeth and bone formation; muscle and nerve activity
6) \( \text{P} \) — teeth and bone formation; muscle and nerve activity
7) \( \text{Cu} \) — development of red blood cells
8) \( \text{K} \) — muscle and nerve activity
9) \( \text{S} \) — hair, nails, and skin builder
The Digestive System

Digestion takes place in four stages:

1) _______________
2) _______________
3) _______________
4) _______________

Label the digestive system:

1) _______________
2) _______________
3) _______________
4) _______________
5) _______________
6) _______________
7) _______________
8) _______________
9) _______________
10) _______________
11) _______________
12) _______________
13) _______________
14) _______________
## Structures and functions of the digestive system:

<table>
<thead>
<tr>
<th>Structure</th>
<th>Function</th>
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</thead>
<tbody>
<tr>
<td>1) lips</td>
<td>holds food in the _________</td>
</tr>
<tr>
<td>2) tongue</td>
<td>helps with chewing and _________ of food</td>
</tr>
<tr>
<td>3) mouth (with teeth)</td>
<td>breaks _________ into small pieces</td>
</tr>
<tr>
<td>4) salivary glands</td>
<td>produces saliva (an enzyme in saliva called _________ breaks down starches)</td>
</tr>
<tr>
<td>5) esophagus</td>
<td>a tube connecting the pharynx and stomach (a series of muscular contractions called _________ pushes food along)</td>
</tr>
<tr>
<td>6) epiglottis</td>
<td>a small flap that covers the ___________ during swallowing to prevent food from entering it</td>
</tr>
<tr>
<td>7) stomach</td>
<td>a thick muscular chamber that breaks down and stores food</td>
</tr>
<tr>
<td></td>
<td>produces _________ juice, made up of HCl, mucus, and pepsin (an enzyme that breaks down protein)</td>
</tr>
<tr>
<td>8) liver</td>
<td>produces bile (bile is a fat _________)</td>
</tr>
<tr>
<td>9) gall bladder</td>
<td>stores and releases _________ into the bile duct</td>
</tr>
<tr>
<td>10) pancreas</td>
<td>produces and releases digestive _________ into the small intestines</td>
</tr>
<tr>
<td>11) small intestine</td>
<td>digestion and absorption of nutrients (fold-like structures called _________ increase the surface area to absorb nutrients)</td>
</tr>
<tr>
<td>12) large intestine</td>
<td>takes undigested material from the small intestine and _________ water and some minerals</td>
</tr>
<tr>
<td>13) rectum</td>
<td>stores _________</td>
</tr>
<tr>
<td>14) anus</td>
<td>the opening at the end of the digestive system through which _________ are eliminated</td>
</tr>
</tbody>
</table>
The Excretory System

The **excretory system** removes liquid and gas wastes from the body. The _____________ filter the blood and remove any wastes. As the blood is filtered, _____________ is formed and passed down the _____________ to the _____________ where it is stored. When the bladder is full, the urine is flushed from the body through the _____________.

*Label the excretory system:*

1) _______________
2) _______________
3) _______________
4) _______________
5) _______________
6) _______________
The Circulatory System

The circulatory system moves ________________ throughout the body. It consists of the heart, three types of blood vessels (arteries, capillaries, and veins) and blood.

The Heart:

The heart is a muscular organ that pumps blood throughout your body. It consists of four chambers: two upper ________________ and two lower ________________. Between the chambers are ________________. Each valve allows blood to flow in only one direction. The “lub dub” sound you hear while listening to your heart through a ________________ is the opening and closing of the valves.

The pathway of blood throughout the heart:

1) ____________________
   ↓
2) ____________________
   ↓
3) ____________________
   ↓
4) ____________________
   ↓
5) ____________________
   ↓
6) ____________________
   ↓
7) ____________________
Types of blood vessels:

1) Arteries - carry _____________ blood away from the heart. They have thick muscular walls in order to maintain _____________ flow.

2) Veins - carry _____________ blood back to the heart. They have thin, stretchy walls with _____________ to prevent backflow of blood.

3) Capillaries - connect arteries to veins, carrying blood to the _____________ of the body.

The components of blood:

1) _____________ (55%)  

2) _____________ (45%)

1) Plasma – a clear, yellowish _____________ that contains water, proteins, minerals, and dissolved salts

2) Blood Cells – includes red blood cells, white blood cells and _____________

Blood cells:

1) red blood cells – carry _____________ from the lungs to the body and carbon dioxide from the body to the lungs

2) white blood cells – fight _____________ and help prevent the growth of cancer

3) platelets – cell fragments that are important for blood _____________
The Respiratory System

The respiratory system supplies blood with _______________ and removes carbon dioxide from the blood.

The respiratory system:

1) _______________ – the space within the nostrils, lined with tiny hair-like cilia and mucus (for warming the air and trapping dirt)

2) _______________ – a tube connecting the nasal cavity and the trachea

3) _______________ – the voice box.

4) _______________ – the airway passage that leads from the larynx to the lungs, held open by rings of cartilage

5) _______________ – a spongy organ that receives air during inhalation, made up of tiny air sacs called alveoli

6) _______________ – a tube branching from the trachea into the lung

7) _______________ – small air tubes branching out from the bronchi

8) _______________ – a dome-shaped muscle

9) _______________ – tiny air sacs at the ends of the bronchioles where gas exchange occurs

10) _______________ – networks of tiny blood vessels surrounding the alveoli

Gas exchange by diffusion in lungs:

(CO₂ diffuses into the alveoli, and O₂ diffuses the other way into the capillaries and binds with the red blood cells)
1) What are the five levels of organization in the human body?

2) What are the four types of tissues?

3) What are the four food groups?

4) What are the six nutrients?

5) What is the function of carbs? What are the two main types?

6) What is the function of protein? What are the two main types?

7) What is the function of fat? What are the two main types?

8) What are the functions of vitamins A, D, E, K, B, and C?
9) What is the function of water?

10) What is the function of minerals?

11) What is the function of the digestive system?

12) What are the four stages of digestion?

13) What is the function of the lips, tongue, and mouth?

14) What is the function of the salivary glands?

15) What is the function of the esophagus?

16) What is the function of the epiglottis?
17) What is the function of the stomach?

18) What is the function of the liver?

19) What is the function of the gallbladder?

20) What is the function of the pancreas?

21) What is the function of the small intestines?

22) What is the function of the large intestines?

23) What are the functions of the rectum and anus?

24) What is the function of the excretory system?
25) What are the functions of the kidneys, ureters, bladder, and urethra?

26) What is the pathway of blood through the heart?

27) What are the functions of arteries, veins, and capillaries?

28) What are the components of blood?

29) What are the functions of red blood cells, white blood cells, and platelets?

30) What is the function of the respiratory system?

31) What is the pathway of air through the respiratory system?

32) What is the function of alveoli during gas exchange in the lungs?