13. Name the basic units of length, weight, and volume in the metric system.

14. Define the metric prefixes kilo-, centi-, milli-, and micro-.

**EXERCISE 1-13.**

**INSTRUCTIONS**

Write the appropriate term in the space provided.

<table>
<thead>
<tr>
<th>kilo-</th>
<th>milli-</th>
<th>centi-</th>
<th>micro-</th>
</tr>
</thead>
<tbody>
<tr>
<td>gram</td>
<td>liter</td>
<td>meter</td>
<td></td>
</tr>
</tbody>
</table>

1. A prefix meaning one hundredth
2. The basic unit of length
3. A prefix meaning one millionth
4. The basic unit of weight
5. A prefix meaning one thousand

15. Show how word parts are used to build words related to the body’s organization.

**EXERCISE 1-14.**

**INSTRUCTIONS**

Complete the following table by writing the correct word part or meaning in the space provided. Write a word that contains each word part in the Example column.

<table>
<thead>
<tr>
<th>Word Part</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. -tomy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. -stasis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>nature, physical</td>
<td></td>
</tr>
<tr>
<td>4. homeo-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>apart, away from</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>down</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>upward</td>
<td></td>
</tr>
<tr>
<td>8. path-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. -logy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Making the Connections

The following concept map deals with the body's cavities and their divisions. Complete the concept map by filling in the blanks with the appropriate word or phrase for the cavity, division, subdivision, or region.

Internally the body is divided into two main cavities.

They are the 1 and the 2

The two subdivisions of this cavity are the 3 and the spinal cavity

The two subdivisions of this cavity are the thoracic cavity and the 4

They are separated by a muscle called the 5

This cavity can be divided into the abdominal cavity and the 6

For the purpose of examination the abdominal cavity can be divided into nine regions. From superior to inferior they are:

Right Lateral

Central

Epigastric region

Left Lateral

Hypochondriac region

Lumbar region

Iliac region
Building Understanding

I. Multiple Choice

Select the best answer and write the letter of your choice in the blank.

1. The coronal plane is also called the:
   a. frontal plane
   b. transverse plane
   c. cross-sectional plane
   d. sagittal plane

2. The diaphragm separates:
   a. the cranial and spinal cavities
   b. the dorsal and ventral cavities
   c. the thoracic and abdominal cavities
   d. the abdominal and pelvic cavities

3. The breakdown of complex molecules into more simple ones is called:
   a. anabolism
   b. synthesis
   c. negative feedback
   d. catabolism

4. Lymph is an example of which type of fluid?
   a. extracellular
   b. intracellular
   c. superior
   d. extraneous

5. The heart and the blood vessels compose the:
   a. circulatory system
   b. nervous system
   c. integumentary system
   d. digestive system

6. The navel is found in the:
   a. lumbar region
   b. umbilical region
   c. iliac region
   d. hypogastric region

7. The study of normal body function is called:
   a. physiology
   b. pathology
   c. anatomy
   d. chemistry

8. A penny-shaped slice of a banana is probably which type of section?
   a. longitudinal section
   b. sagittal section
   c. cross section
   d. coronal section
II. Completion Exercise

Group A: General Terminology

Write the word or phrase that correctly completes each sentence.

1. In the anatomic position, the body is upright and palms are facing
2. Fluid inside cells is called
3. Catabolism releases energy in the form of
4. Negative feedback is a mechanism for maintaining an internal state of balance known as
5. The sum of all catabolic and anabolic reactions in the body is called
6. The process of childbirth is an example of a type of feedback called

Group B: Body Cavities, Directional Terms, and Planes of Division

1. The term that means nearer to the head is
2. The space enclosing the brain and spinal cord forms a continuous cavity called the
3. The abdomen may be divided into four regions, each of which is called a(n)
4. The cavity that houses the bladder is the
5. The plane that divides the body into anterior and posterior parts is the
6. The ventral body cavity that contains the stomach, most of the intestine, the liver, and the spleen is the
7. The abdomen may be subdivided into nine regions, including three along the midline. The region closest to the sternum (breastbone) is the
8. The space between the lungs is called the
9. The diaphragm separates the abdominopelvic cavity from the

Group C: The Metric System

Write the word that correctly completes each sentence.

1. The number of milligrams in a gram is
2. The number of centimeters in an inch is
3. The number of millimeters in a centimeter is
4. Using the metric system, your height would probably be calculated in
5. A liter is a slightly greater volume than a
Understanding Concepts

I. True/False

For each question, write T for true or F for false in the blank to the left of each number. If a statement is false, correct it by replacing the underlined term and write the correct statement in the blank below the question.

_____ 1. Proteins are broken down into their component parts by the process of anabolism.

_____ 2. Your mouth is inferior to your nose.

_____ 3. The brain is caudal to the spine.

_____ 4. Your umbilicus is lateral to the left lumbar region.

_____ 5. The right iliac region is found in the right lower quadrant.

II. Practical Applications

Study each discussion. Then write the appropriate word or phrase in the space provided.

> Group A: Directional Terms

1. The gallbladder is located just above the colon. The directional term that describes the position of the gallbladder with regard to the colon is ____________.

2. The kidneys are closer to the sides of the body than is the stomach. The directional term that describes the kidneys with regard to the stomach is ____________.

3. The entrance to the stomach is nearest the point of origin or beginning of the stomach, so this part is said to be ____________.

4. The knee is located closer to the hip than is the ankle. The term that describes the position of the ankle with regard to the knee is ____________.

5. The ears are closer to the back of the head than is the nose. The term that describes the position of the ears with regard to the nose is ____________.

6. The stomach is below the esophagus; it may be described as ____________.

7. The head of the pancreas is nearer the midsagittal plane than is its tail portion, so the head part is more ____________.
Group B: Body Cavities and the Metric System

Study the following cases and answer the questions based on the nine divisions of the abdomen and your knowledge of the metric system.

1. Mr. A bruised his ribs in a dirt buggy accident. He experienced tenderness in the upper left side of his abdomen. In which of the nine abdominal regions are the injured ribs located?

2. Ms. D had a history of gallstones. The operation to remove these stones involved the upper right part of the abdominal cavity. Which abdominal division is this?

3. Following her operation, Ms. D was able to bring her stones home in a jar. She was told that her stones weighed 0.025 kg in total. How many milligrams do her stones weigh?

4. Ms. C is 8 weeks pregnant. Her uterus is still confined to the most inferior division of the abdomen. This region is called the ____________.

5. Ms. C is experiencing heartburn as a result of her pregnancy. The discomfort is found just below the breastbone, in the ____________.

6. Following the birth of her child, Ms. C opted for a tubal ligation. The doctor threaded a fiberoptic device through a small incision in her navel as part of the surgery. Ms. C will now have a very small incision in which portion of the abdomen?

7. Ms. C's incision was 2 mm in length. What is the length of her incision in centimeters?

Group C: Body Systems

The triage nurse in the emergency room was showing a group of students how she assessed patients with disorders in different body systems. Study each situation, and answer the following questions based on your knowledge of the 11 body systems.

1. One person was complaining of dizziness and blurred vision. Vision is controlled by the ____________.

2. One person had been injured in a snowboarding accident, spraining his wrist joint. The wrist joint is part of the ____________.

3. A woman had attempted a particularly onerous yoga pose and felt a sharp pain in her left thigh. Now she was limping. The nurse suspected a tear to structures belonging to the ____________.

4. An extremely tall individual entered the clinic, complaining of a headache. The nurse suspected that he had excess production of a particular hormone. The specialized glands that synthesize hormones make up the ____________.

5. A middle-aged woman was brought in with loss of ability to move the right side of her body. The nurse felt that a blood clot in a blood vessel of the brain was producing the symptoms. Blood vessels are part of the ____________.

6. A man complaining of pain in the abdomen and vomiting blood was brought in by his family. A problem was suspected in the system responsible for taking in food and converting it to usable products. This system is the ____________.

7. Each client was assessed for changes in the color of the outer covering of the body. The outer covering is called the skin, which is part of the ____________.

8. A young woman was experiencing pain in her pelvic region. The doctor suspected a problem with her ovaries. The ovaries are part of the ____________.

9. An older man was experiencing difficulty with urination. The production of urine is the function of the ____________.
III. Short Essays

1. Compare and contrast the terms anabolism and catabolism. List one similarity and one difference.

2. Which type of feedback, negative or positive, is used to maintain homeostasis? Defend your answer, referring to the definition of homeostasis.

3. Explain why specialized terms are needed to indicate different positions and directions within the body. Provide a concrete example.

Conceptual Thinking

1. Consider the role of negative feedback in the ability of a thermostat to keep your house at the same temperature. What would happen on a hot day if your thermostat worked according to the principles of positive feedback?
2. Consider the role of positive feedback in childbirth. Is childbirth a good example of homeostasis? Would the baby be delivered if stretching of the uterine muscles inhibited oxytocin secretion?

3. A disease at the chemical level can have an effect on the whole body. That is, a change in a chemical affects a cell, which alters the functioning of a tissue, which disrupts an organ, which disrupts a system, which results in body dysfunction. Illustrate this concept by rewriting the following description in your own words using the different levels of organization: chemical, cell, tissue, organ, system, and body. (Hint: blood is a tissue.) Which of the bold terms applies to each level of organization? Which level of organization is not explicitly stated?

Mr. S. experiences pain throughout his body. The movement of blood through his vessels is impaired. His blood cells are misshapen. A chemical found in red blood cells called hemoglobin is abnormal.

Expanding Your Horizons

As a student of anatomy and physiology, you have joined a community of scholars stretching back into prehistory. The history of biological thought is a fascinating one, full of murder and intrigue. We think that scientific knowledge is entirely objective. However, as the following books will show, theories of anatomy, physiology, and disease depend upon societal factors such as economic class, religion, and gender issues.

Resources