



THE HUMAN BODY: AN ORIENTATION

Most of us have a natural curiosity about our bodies, and a study of anatomy and physiology elaborates on this interest. Anatomists have developed a universally acceptable set of reference terms that allows body structures to be located and identified with a high degree of clarity. Initially, students might have difficulties with the language used to describe anatomy and physiology, but without such a special vocabulary, confusion is bound to occur.

The topics in this chapter enable students to test their mastery of terminology commonly used to describe the body and its various parts, and concepts concerning functions vital for life and homeostasis. Body organization from simple to complex levels and an introduction to the organ systems forming the body as a whole are also covered.

AN OVERVIEW OF ANATOMY AND PHYSIOLOGY

1. Match the terms in Column B to the appropriate descriptions provided in Column A. Enter the correct letter or its corresponding term in the answer blanks.

Column A

- _____ 1. The branch of biological science that studies and describes how body parts work or function
- _____ 2. The study of the shape and structure of body parts
- _____ 3. The tendency of the body's systems to maintain a relatively constant or balanced internal environment
- _____ 4. The term that indicates *all* chemical reactions occurring in the body

Column B

- A. Anatomy
- B. Homeostasis
- C. Metabolism
- D. Physiology

HOMEOSTASIS

10. The following statements refer to homeostatic control systems. Complete each statement by inserting your answers in the answer blanks.

- _____ 1. There are three essential components of all homeostatic control mechanisms: control center, receptor, and effector. The _____ 2. _____ (1) senses changes in the environment and responds by sending information (input) to the _____ (2) along the _____ (3) pathway. The _____ (4) analyzes the input, determines the appropriate response, and activates the _____ (5) by sending information along the _____ (6) pathway. When the response causes the initial stimulus to decline, the homeostatic mechanism is referred to as a _____ (7) feedback mechanism. When the response enhances the initial stimulus, the mechanism is called a _____ (8) feedback mechanism. _____ (9) feedback mechanisms are much more common in the body.
- _____ 8.
- _____ 9.

THE LANGUAGE OF ANATOMY

11. Complete the following statements by filling in the answer blanks with the correct term.

- _____ 1. The abdominopelvic and thoracic cavities are subdivisions of the _____ (1) body cavity; the cranial and spinal cavities are parts of the _____ (2) body cavity. The _____ (3) body cavity is totally surrounded by bone and provides very good protection to the structures it contains.
- _____ 3.

12. Circle the term or phrase that does not belong in each of the following groupings.

- | | | | |
|-------------------|--------------|----------------|---------------------|
| 1. Transverse | Distal | Frontal | Sagittal |
| 2. Lumbar | Thoracic | Antecubital | Abdominal |
| 3. Calf | Brachial | Femoral | Popliteal |
| 4. Epigastric | Hypogastric | Right iliac | Left upper quadrant |
| 5. Orbital cavity | Nasal cavity | Ventral cavity | Oral cavity |

13. Select different colors for the *dorsal* and *ventral* body cavities. Color the coding circles below and the corresponding cavities in part A of Figure 1-7. Complete the figure by labeling those body cavity subdivisions that have a leader line. Complete part B by labeling each of the abdominal regions indicated by a leader line.

Dorsal body cavity

Ventral body cavity

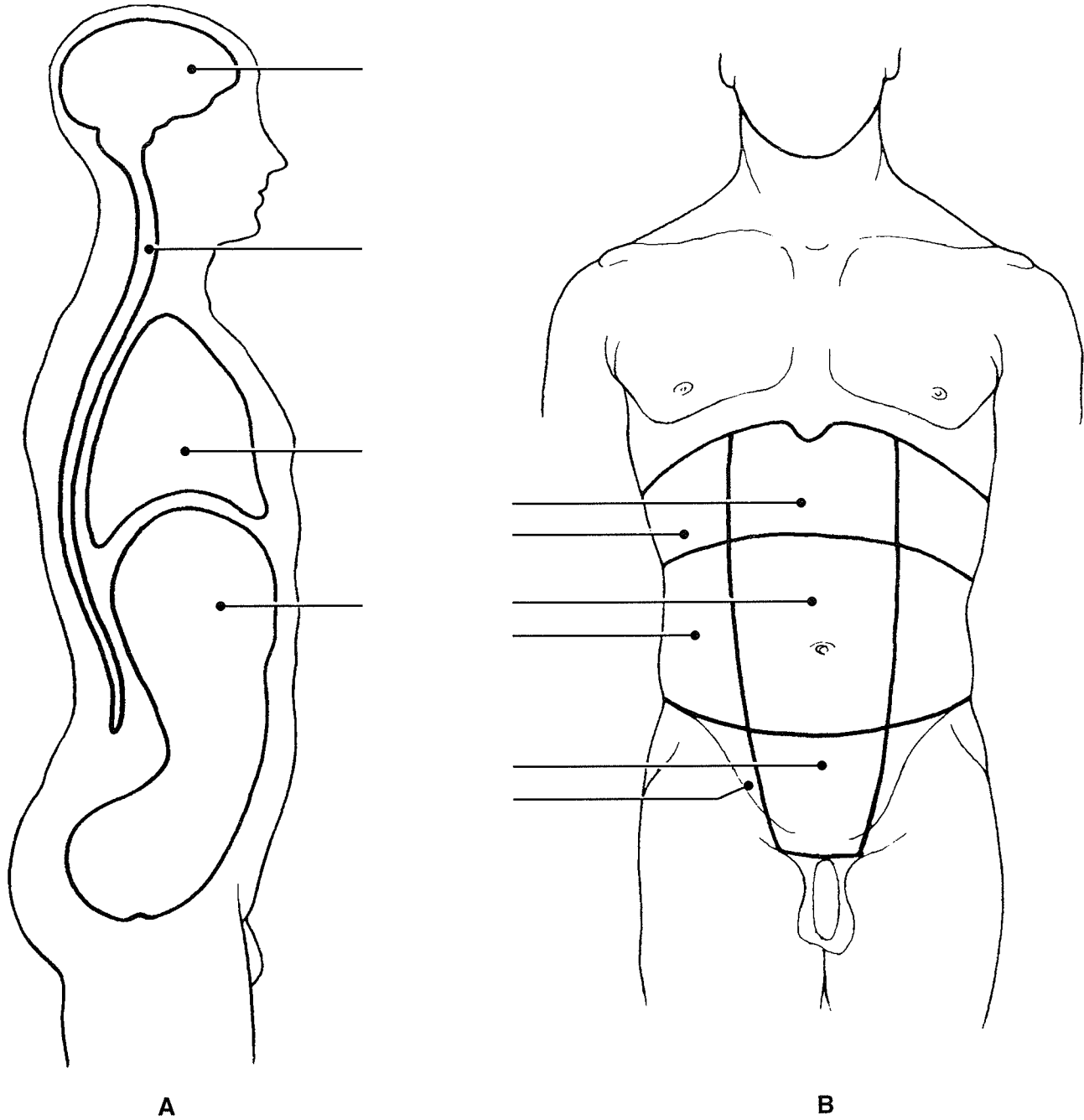


Figure 1-7

10 Anatomy & Physiology Coloring Workbook

- 14.** Select the key choices that identify the following body parts or areas.
Enter the appropriate letter or corresponding term in the answer blanks.

Key Choices

- | | | | |
|----------------|-------------|--------------|--------------|
| A. Abdominal | E. Buccal | I. Inguinal | M. Pubic |
| B. Antecubital | F. Cervical | J. Lumbar | N. Scapular |
| C. Axillary | G. Femoral | K. Occipital | O. Sural |
| D. Brachial | H. Gluteal | L. Popliteal | P. Umbilical |

- _____ 1. Armpit
- _____ 2. Thigh region
- _____ 3. Buttock area
- _____ 4. Neck region
- _____ 5. "Belly button" area
- _____ 6. Genital area
- _____ 7. Anterior aspect of elbow
- _____ 8. Posterior aspect of head
- _____ 9. Area where trunk meets thigh
- _____ 10. Back area from ribs to hips
- _____ 11. Pertaining to the cheek

- 15.** Using the key terms from Exercise 14, correctly label all body areas indicated with leader lines on Figure 1–8.

In addition, identify the sections labeled A and B in the figure.

Section A: _____

Section B: _____

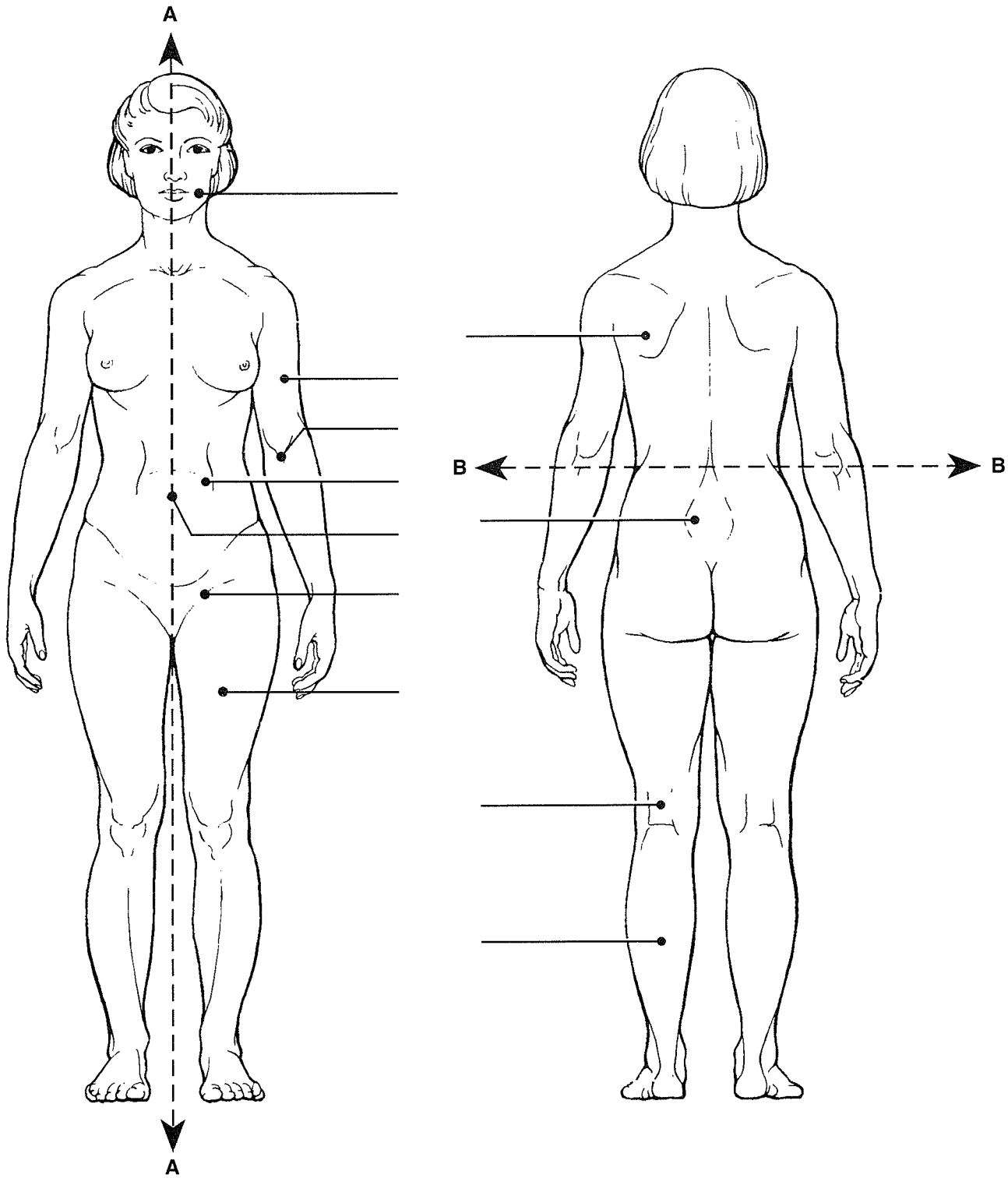


Figure 1-8

16. From the key choices, select the body cavities where the following surgical procedures would occur. Insert the correct letter or term in the answer blanks. Be precise. Also select the name of the cavity subdivision if appropriate.

Key Choices

- | | | | |
|--------------|-----------|-------------|------------|
| A. Abdominal | C. Dorsal | E. Spinal | G. Ventral |
| B. Cranial | D. Pelvic | F. Thoracic | |

- _____ 1. Removal of the uterus, or womb
- _____ 2. Coronary bypass surgery (heart surgery)
- _____ 3. Removal of a serious brain tumor
- _____ 4. Removal of a "hot" appendix
- _____ 5. A stomach ulcer operation

17. Complete the following statements by choosing an anatomical term from the key choices. Enter the appropriate letter or term in the answer blanks.

Key Choices

- | | | | |
|-------------|-------------|--------------|---------------|
| A. Anterior | D. Inferior | G. Posterior | J. Superior |
| B. Distal | E. Lateral | H. Proximal | K. Transverse |
| C. Frontal | F. Medial | I. Sagittal | |

- _____ 1. In the anatomical position, the face and palms are on the _____ (1) body surface, the buttocks and shoulder blades are on the _____ (2) body surface, and the top of the head is the most _____ (3) part of the body. The ears are _____ (4) to the shoulders and _____ (5) to the nose. The heart is _____ (6) to the spine and _____ (7) to the lungs. The elbow is _____ (8) to the fingers but _____ (9) to the shoulder. In humans, the dorsal surface can also be called the _____ (10) surface; however, in four-legged animals, the dorsal surface is the _____ (11) surface.
- _____ 2.
- _____ 3.
- _____ 4.
- _____ 5.
- _____ 6.
- _____ 7.
- _____ 8.
- _____ 9.
- _____ 10.
- _____ 11.

- _____ 12. If an incision cuts the heart into right and left parts, the section is a (12) section, but if the heart is cut so that anterior and posterior parts result, the section is a (13) section.
- _____ 13. You are told to cut an animal along two planes so that the paired kidneys are observable in both sections. The two sections that meet this requirement are the (14) and (15) sections.
- _____ 14.
- _____ 15.

- 18.** Using the key choices, identify the body cavities where the following body organs are located. Enter the appropriate letter or term in the answer blanks.

Key Choices

A. Abdominopelvic

B. Cranial

C. Spinal

D. Thoracic

- | | | | |
|-------|--------------------|-------|---------------------|
| _____ | 1. Stomach | _____ | 7. Bladder |
| _____ | 2. Small intestine | _____ | 8. Trachea |
| _____ | 3. Large intestine | _____ | 9. Lungs |
| _____ | 4. Spleen | _____ | 10. Pituitary gland |
| _____ | 5. Liver | _____ | 11. Rectum |
| _____ | 6. Spinal cord | _____ | 12. Ovaries |

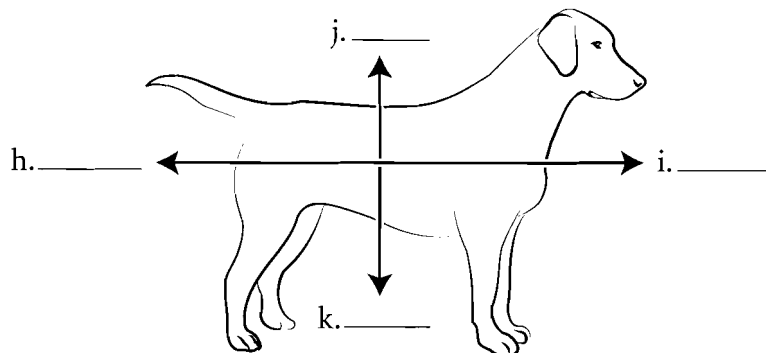
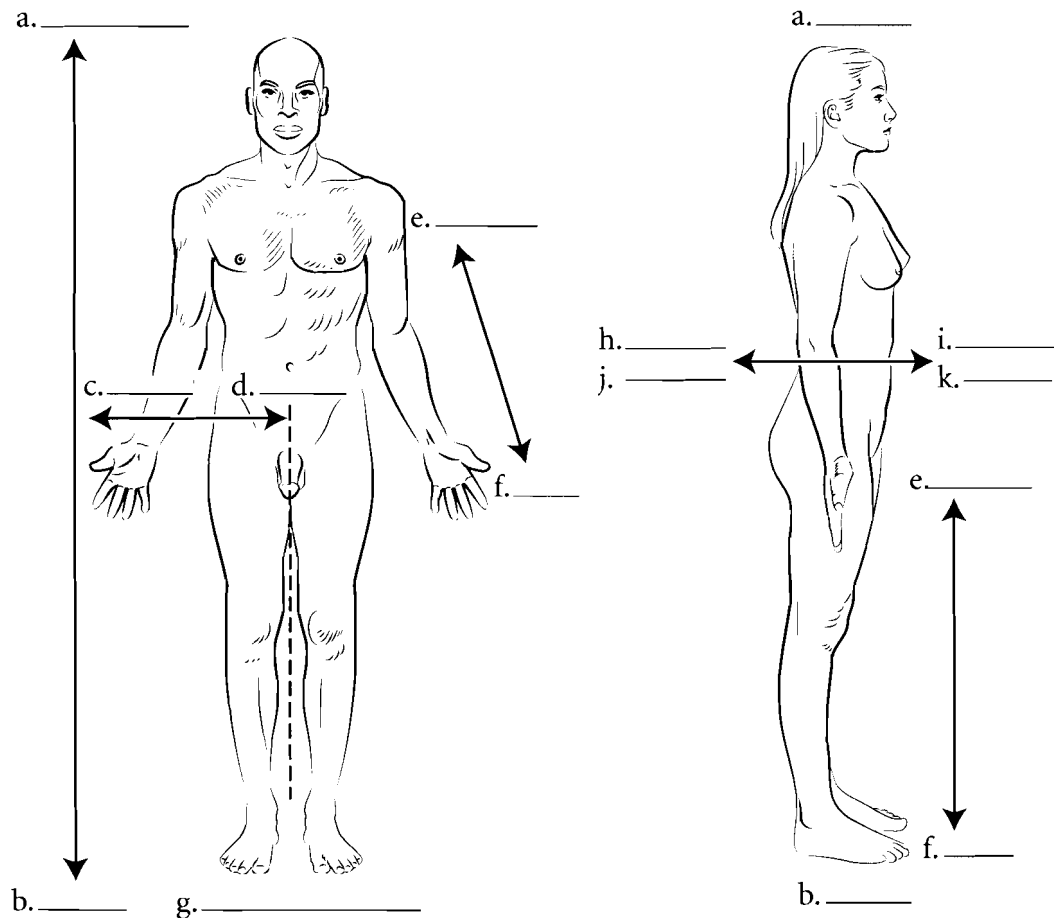
- 19.** Number the following structures, from darkest (black) to lightest (white), as they would appear on an X ray. Number the darkest one 1, the next darkest 2, etc.

- _____ A. Soft tissue
- _____ B. Femur (bone of the thigh)
- _____ C. Air in lungs
- _____ D. Gold (metal) filling in a tooth

ANATOMICAL POSITION AND TERMS OF DIRECTION

When studying the human body it is important to place the body in anatomical position. **Anatomical position** is described as the body facing you, feet placed together and flat on the floor. The head is held erect, arms straight by the side with palms facing forward. All references to the body are made as if the body is in this position so when you describe something as being above something else it is always with respect to the body being in anatomical position.

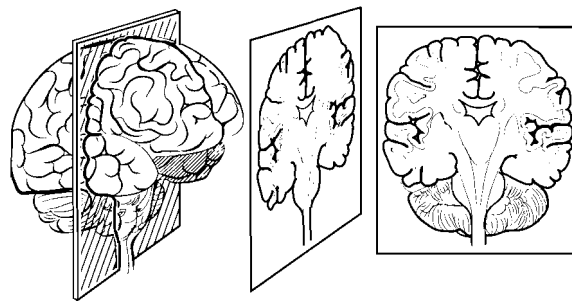
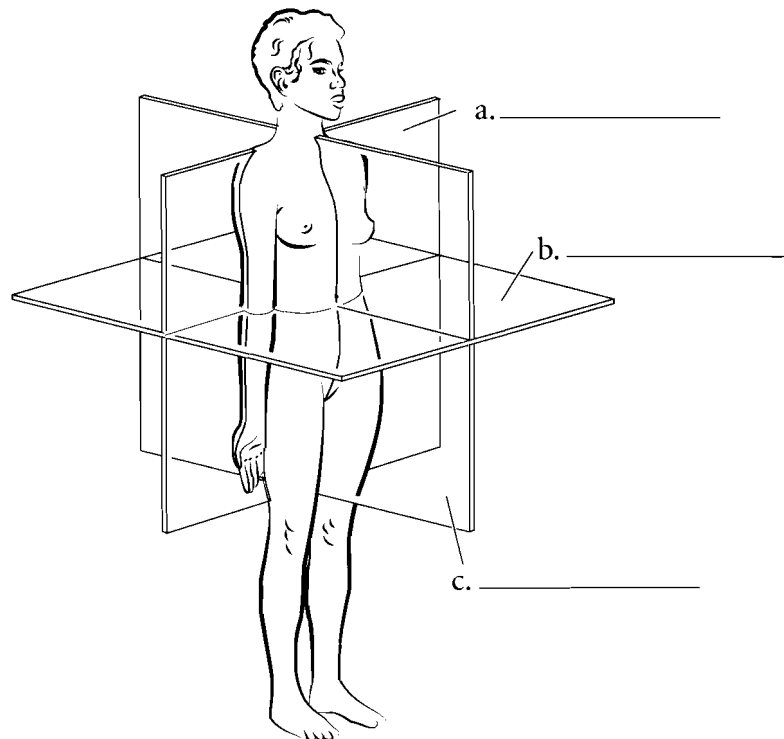
The relative position of the parts of the human body has specific terms. **Superior** means above while **inferior** means below. **Medial** refers to being close to the midline while **lateral** means to the side. **Anterior** or **ventral** is to the front while **posterior** or **dorsal** is to the back. Superficial is near the surface while deep means to the core of the body. When working with the limbs, **proximal** means closer to the trunk while **distal** is to the ends of the extremities. Write the directional terms in the spaces provided and color in the arrows in reference to these terms. Note that these terms are somewhat different for four legged animals.



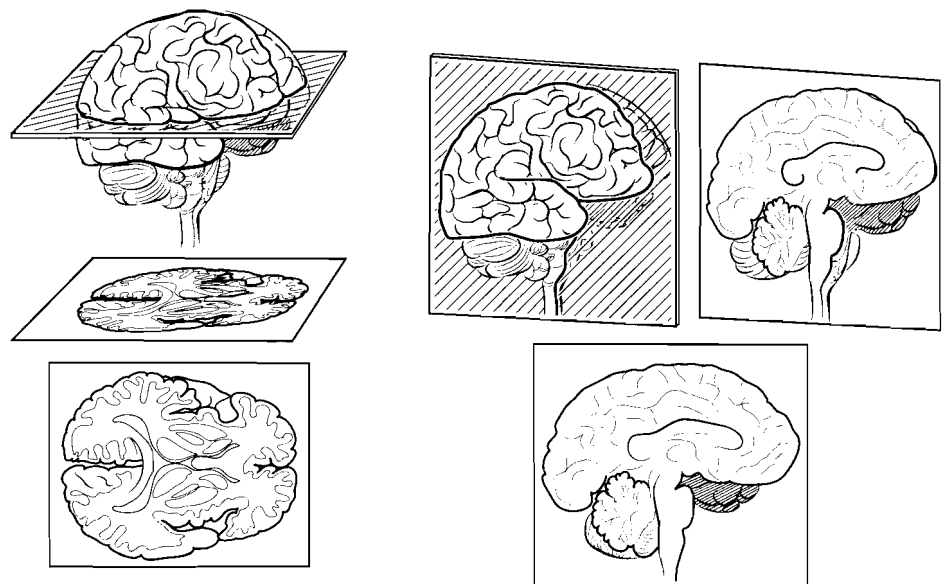
Answer Key: a. Superior, b. Inferior, c. Lateral, d. Medial, e. Proximal, f. Distal, g. Anatomical position, h. Posterior, i. Anterior, j. Dorsal, k. Ventral

ANATOMICAL PLANES OF THE BODY

Many specimens in anatomy are sectioned so that the interior of the organ or region can be examined. It is important that the direction of the cut is known so that the proper orientation of the specimen is known. A heart looks very different if it is cut along its length as opposed to horizontally. A horizontal cut is known as a **transverse section** or a **cross section**. A cut that divides the body or an organ into anterior and posterior parts is a **coronal section** or **frontal section**. One that divides the structure into left and right parts is a **sagittal section**. If the body is divided directly down the middle the section is known as a **midsagittal section**. A midsagittal section is usually reserved for dividing the body into to equal left and right parts. If an organ (such as the eye) is sectioned into two equal parts such that there is a left and right half then this is known as a **median section**. Label the illustrations and color in the appropriate planes.



a. _____



b. _____

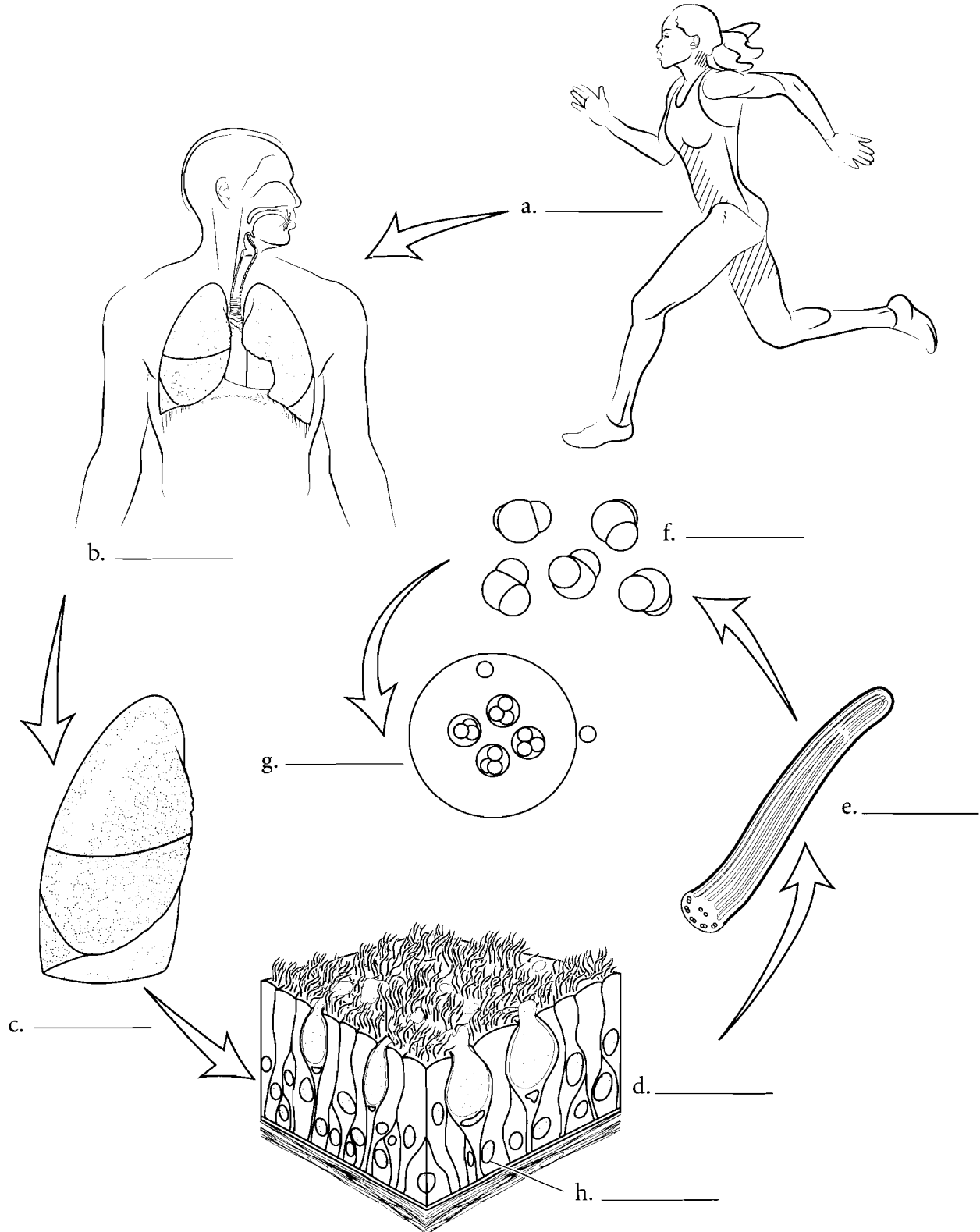
c. _____

Answer Key: a. Frontal (coronal) plane,
b. Transverse (cross-section) plane,
c. Median (midsagittal) plane

HIERARCHY OF THE BODY

The human body can be studied at different levels. Organs such as the stomach can be grouped into organ systems (digestive system) or can be studied on a smaller scale like the cellular level. The ranking of these levels is called a **hierarchy**. The smallest organizational unit is the **atom**. Individual atoms are grouped into larger structures called **molecules**.

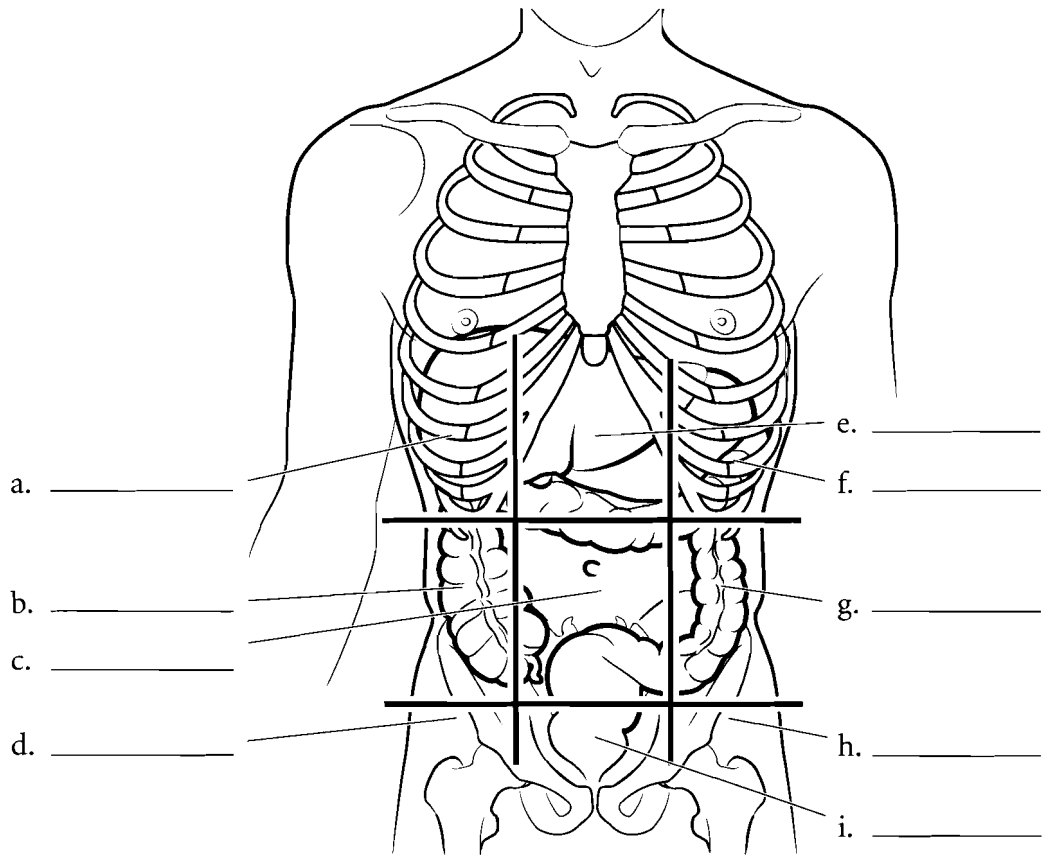
These in turn make up **organelles**, which are part of a larger, more complicated systems called **cells**. Cells are the structural and functional units of life. Cells are clustered into **tissues**. **Organs** are discrete units made up of two or more tissues and organs are grouped into **organ systems** that compose the **organism**. Label the levels of the hierarchy and color each item a different color.



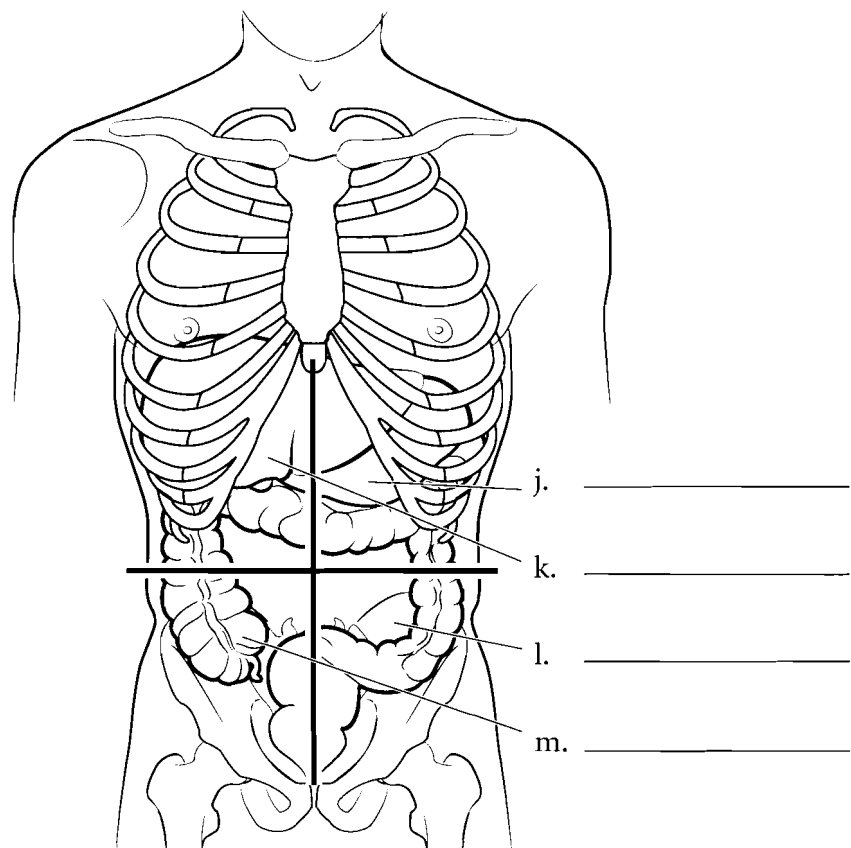
Answer Key: a. Organism (human), b. Organ system (respiratory system) c. Organ (lung), d. Tissue (epithelium), e. Organelle (cilia), f. Molecule, g. Atom, h. cells

REGIONS OF THE ABDOMEN

In anatomy the abdomen is divided into nine regions. Write the names of the regions in the spaces indicated. Color both the left and right **hypochondriac** regions in light blue. Hypochondriac means “below the cartilage.” The common use of the word (someone who thinks they are sick all the time) reflects the Greek origin of the word as the ancient Greeks considered the region to be the center of sadness. Inferior to the hypochondriac regions are the **lumbar** or **lateral abdominal** regions. These are commonly known as the “love handles.” Use yellow for these regions. Below the lumbar regions are the **inguinal** or **iliac** regions. You should color in these regions with the same shade of green. In the middle of the abdomen is the **umbilical** region. Color this region in red. Above this is the **epigastric** region (*epi* = above and *gastric* = stomach). Color this region in purple. Below the umbilical region is the **hypogastric** region (*hypo* = below). Color this region in a darker blue.



In clinical settings a quadrant approach is used. Write the names of the regions (**right upper quadrant, left upper quadrant, right lower quadrant, left lower quadrant**) in the spaces provided. Color each quadrant a different color.

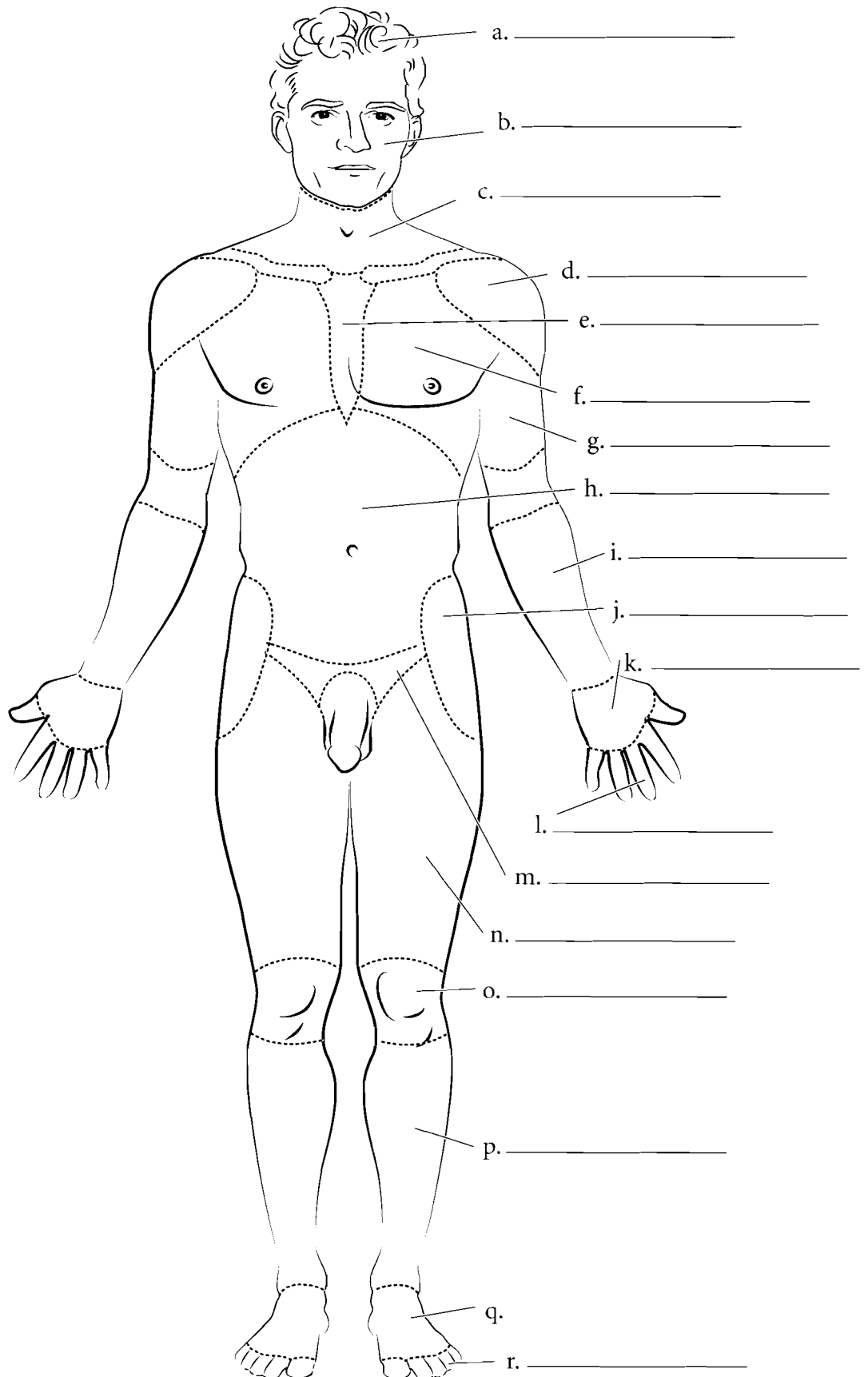


Answer Key: a. Right hypochondriac, b. Right lumbar (lateral abdominal), c. Umbilical, d. Right inguinal or iliac, e. Epigastric, f. Left hypochondriac, g. Left lumbar (lateral abdominal), h. Left inguinal or iliac, i. Hypogastric, j. Left upper quadrant, k. Right upper quadrant, l. Left lower quadrant, m. Right lower quadrant

BODY REGIONS (ANTERIOR)

There are specific anatomical terms for regions of the body. These areas or regions frequently have Greek or Latin names because early western studies in anatomy occurred in Greece and Rome. During the Renaissance, European scholars studied anatomy and applied the ancient names to the structures. Label the various regions of the body and fill in their names. You can use a standard anatomy text or follow the key at the bottom of the page. A list of terms and their common names follows for the anterior side of the body. Color in the regions of the body.

- cranial** (head)
- facial** (face)
- cervical** (neck)
- deltoid** (shoulder)
- pectoral** (chest)
- sternal** (center of chest)
- brachial** (arm)
- antebrachial** (forearm)
- manual** (hand)
- digital** (fingers)
- abdominal** (belly)
- inguinal** (groin)
- coxal** (hip)
- femoral** (thigh)
- genicular** (knee)
- crural** (leg)
- pedal** (foot)
- digital** (toes)

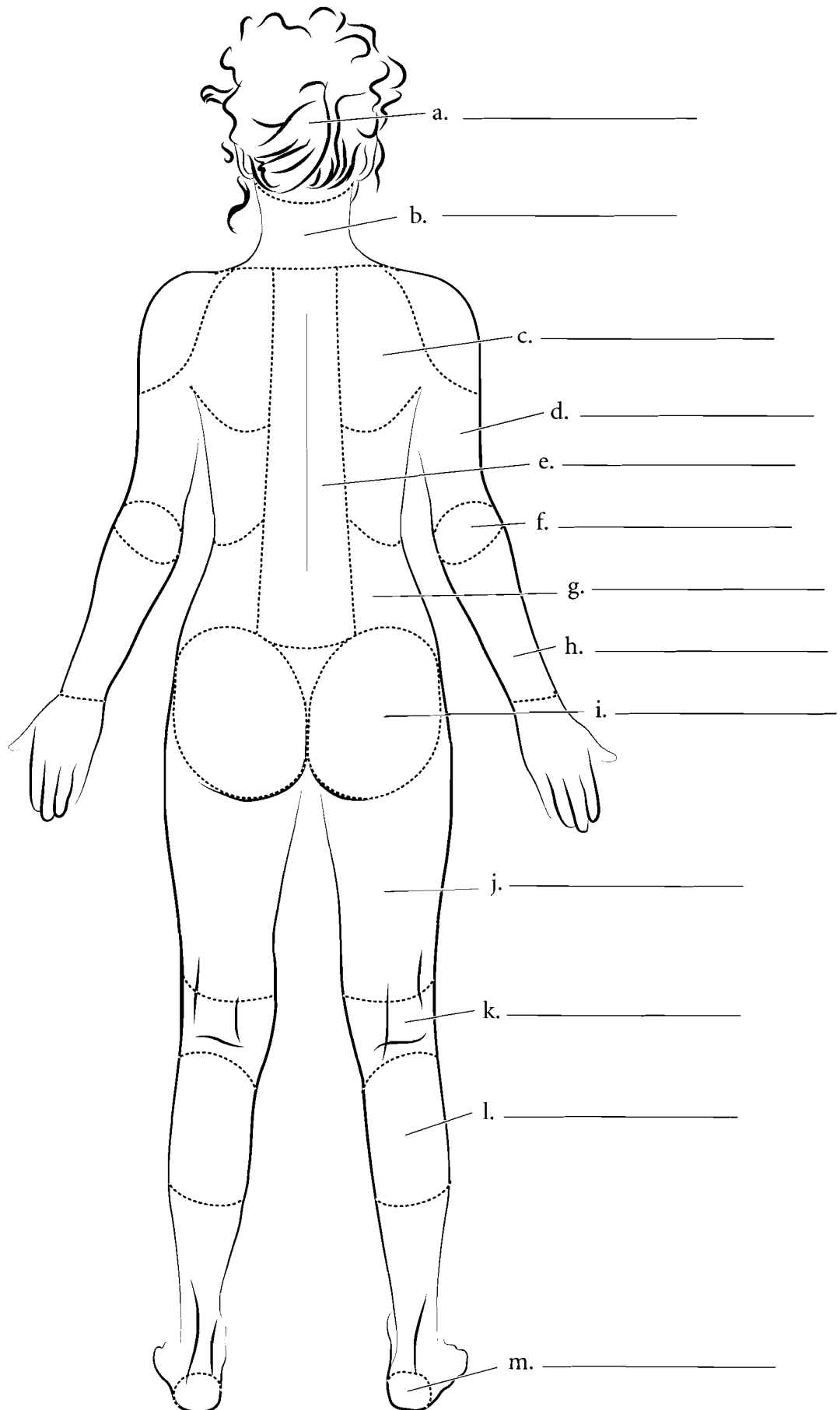


Answer Key: a. Cranial (head), b. Facial (face), c. Cervical (neck), d. Deltoid (shoulder), e. Sternal (center of chest), f. Pectoral (chest), g. Brachial (arm), h. Abdominal (belly), i. Antebrachial (forearm), j. Coxal (hip), k. Manual (hand), l. Digital (fingers), m. Inguinal, n. Femoral (thigh), o. Genicular (knee), p. Crural (leg), q. Pedal (foot), r. Digital (toes)

BODY REGIONS (POSTERIOR)

For the posterior view of the body fill in the terms and color the regions of the body. The anatomical names are given first with the common names in parentheses.

- cephalic** (head)
- nuchal** (neck)
- scapular** (shoulder blade)
- vertebral** (backbone)
- lumbar** (love handles)
- brachial** (arm)
- olecranon** (elbow)
- antebrachial** (forearm)
- gluteal** (buttocks)
- femoral** (thigh)
- popliteal** (back of knee)
- sural** (calf)
- calcaneal** (heel)

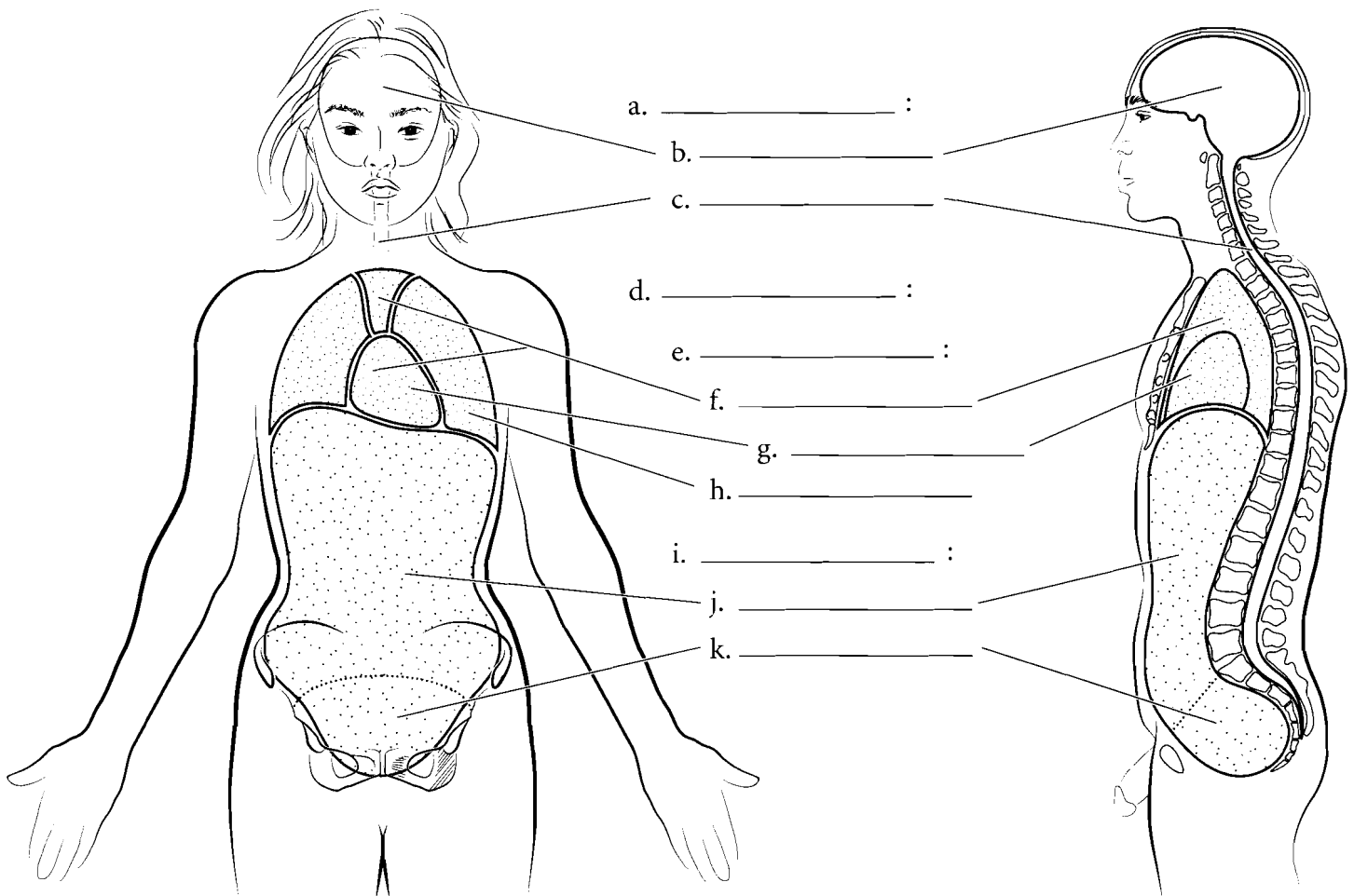


Answer Key: a. Cephalic (head),
 b. Nuchal (neck), c. Scapular (shoulder
 blade), d. Brachial (arm), e. Vertebral
 (backbone), f. Olecranon (elbow),
 g. Lumbar (love handles),
 h. Antebrachial (forearm), i. Gluteal
 (buttocks), j. Femoral (thigh),
 k. Popliteal (back of knee), l. Sural
 (calf), m. Calcaneal (heel)

BODY CAVITIES

The organs of the body are frequently found in body cavities. The body is divided into two main cavities, the **dorsal body cavity** and the **ventral body cavity**. The dorsal body cavity consists of the **cranial cavity**, which houses the brain and the **spinal canal**, which surrounds the spinal cord. The ventral body cavity contains the upper **thoracic cavity**, which is subdivided into the **pleural cavities**, housing the lungs, and the

mediastinum. The mediastinum contains the heart in the **pericardial cavity**, the major vessels near the heart, nerves, and the esophagus. Below the thoracic cavity is the **abdominopelvic cavity**, which contains the upper **abdominal cavity**, housing the digestive organs, and the inferior **pelvic cavity**, which holds the uterus and rectum in females or just the rectum in males. Label the specific and major cavities of the body and color them with different colors.



Answer Key: a. Dorsal body cavity, b. Cranial cavity, c. Spinal canal, d. Ventral body cavity, e. Thoracic cavity, f. Mediastinum, g. Pericardial cavity, h. Pleural cavity, i. Abdominopelvic cavity, j. Abdominal cavity, k. Pelvic cavity