

BSC 2085L



Laboratory Manual
Fifth Edition

Indian River State College

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ANATOMY AND PHYSIOLOGY I

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Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

ISBN 978-1-5339-4197-8

Macmillan Learning Curriculum Solutions

14903 Pilot Drive

Plymouth, MI 48170

www.macmillanlearning.com

Smigelski 4197-8 F21

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Preface

This manual has been created with student success in mind. Many of the current lab manuals on the market contain a lot of the information that is already in your textbook. Our manual contains the material that you are responsible for in lab. This will enable you to study the pertinent information without the distraction of extraneous information. In no way does this imply that because we are not teaching a certain area, topic, or structure in lab that these things are not important. In this manual, we have included key structures that represent each body system, so that upon successful completion of this course, you will have been exposed to clinically significant anatomy that will help you be successful in your chosen health-care profession. This manual is the third edition, and therefore it is a work in progress. If you, as the student, have suggestions for upcoming editions, please let your instructor know. Sometimes your instructor has been teaching this subject for so many years that the information is second nature to them, so items which might be helpful to the student may be overlooked by the instructor. So if there is an item or piece of information that you find really helps you, please let us know. The next page is a note area for you to make comments and suggestions.

Sincerely,

Dr. Hammer



Over the semester please make constructive notes or comments on this sheet and give it to your instructor at the end of the semester. This is in an effort to make our labs the best environment for our students' learning. For example, if you find a really good way to study or something unique your instructor did, please make note of it.

Medical Terminology, Body Positions, and Organ Systems Section:

Integumentary System and Histology Section:

Skeletal System Section:



x

Muscles Section:

Nervous System and Special Senses Section:

Overall Comments:

Microscopes



Microscopes are important tools for biologists to use because they permit the study of living things, or parts of living things, too small to be seen with the naked eye. You will be using a microscope in a few laboratory sessions. You will use a **compound microscope**. You will learn the use and care of these microscopes in this laboratory exercise. Any time you are using a microscope, it is important to remember that a microscope is a delicate instrument and should be handled with care.

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The Compound Microscopes

Microscope components: Learning and practicing proper focusing technique is important to prevent you from carelessly damaging your microscope or the microscope slides. Refer to Figure 1 for the following discussion of the parts of the compound microscope. The goal is to focus as closely as possible on an object. The compound microscope consists of a set of lenses; the higher the magnification, the closer the object in the slide will appear. There are two lenses that magnify an object: the ocular and the objective. At the top of the microscope is the **ocular** (eyepiece); a microscope can have one ocular (monocular) or two oculars (binocular). The power of the ocular lenses in this binocular microscope is 10×; however, these lenses are replaceable by lenses of different magnifications. Next are the **objectives**, which are separated at the proper working distance from the oculars by the **body tube**. The microscope in lab is equipped with four objective lenses. The objectives differ in length depending on their magnification power; the smaller the length of the objective, the lower is its power. The revolving nosepiece of your microscope includes a **4× scanning objective**, a **10× low-power objective**, and a **40× high-power objective**. The highest-power objective (**100×**) is the **oil immersion lens**. Oil prevents the loss of light rays due to defraction. Because the brightness of the field decreases as the magnification power increases, oil is needed to collect sufficient light under the highest-power objective.

The **total magnification** of a microscope lens system is the product of the powers of magnification of the ocular lens and the objective lens. Again, the oculars on these microscopes are 10×. So, if you are looking at a specimen under the 40× high-power objective lens, the total magnification of that specimen is 400× ($10 \times 40 = 400$). This means that the specimen appears through the microscope to be 400 times larger than it actually is.

The object to be viewed is usually affixed to a slide and protected by a coverslip. The slide is then placed under the objective on the **stage** and held there firmly by a spring-loaded **stage clip**. On your microscope, the slide can be manipulated under the objective by means of a movable stage. Two **stage control knobs** located under the stage regulate this movement. You are able to bring your specimen into focus by moving the stage up or down. Two knobs located on the arm of the microscope control this movement: the **coarse-adjustment knob**, which moves the stage large distances, and the **fine-adjustment knob**, which moves the stage very slight distances.

Notes:

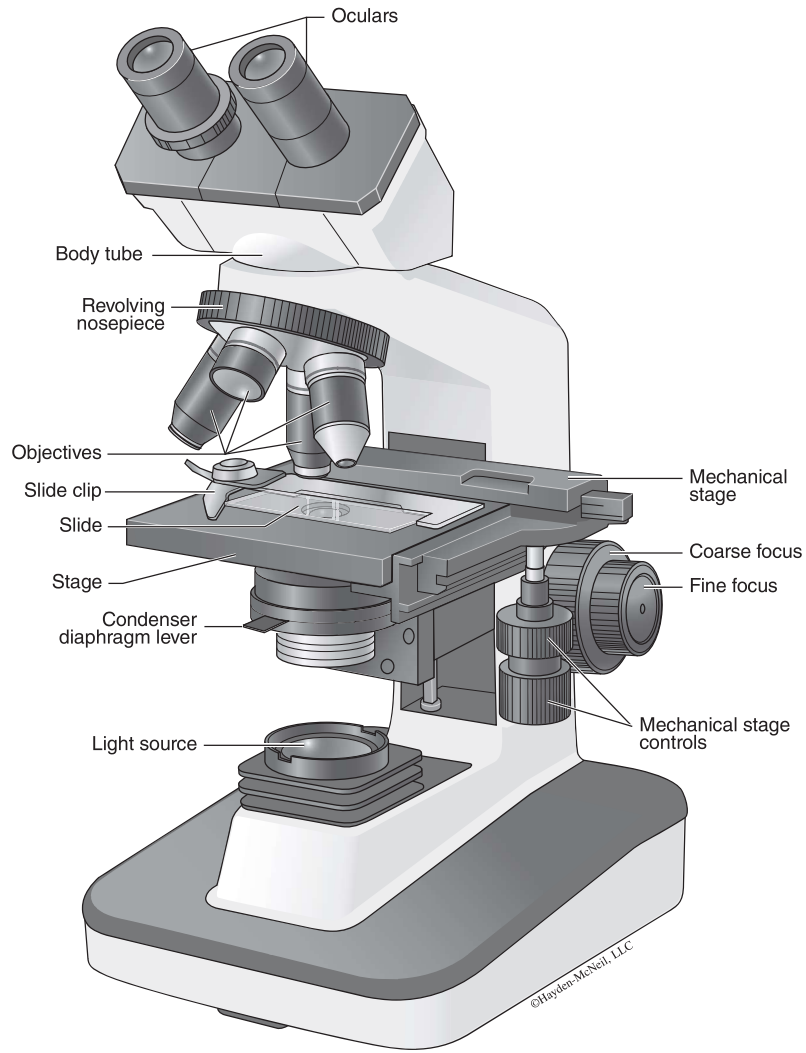


Figure 1. The parts of the compound microscope.

Notes:

4 Microscopes

When first looking at a new slide, always start with a short objective lens, either the 4× scanning lens or the 10× low-power objective. Place the slide in the clip on the stage. While watching from the side of the microscope, use the coarse-adjustment knob to carefully bring the stage up to its highest position (it will still be a safe distance from the specimen). Now look through the ocular lenses and slowly lower the stage until the specimen comes into focus.

This microscope is designed to be **parfocal**, that is, once you have focused on a specimen, the specimen should remain relatively in focus when you move to a different objective lens. Once you have a specimen in focus, you need to make adjustments of focus only with the fine-adjustment knob. Never use the coarse-adjustment knob when the higher-power objectives are in position.

The distance between the objective lens and the slide is called the **working distance**. It is quite large with the lowest-power objective lens but decreases with each increase in objective power. The working distance for your highest-power lenses is very small. The 40× and 100× objective lenses are spring-loaded to prevent damage when rotating them into place.

The **light source** is located in the **base** of your microscope. You can turn it on and adjust the intensity of light with a rheostatic knob also on the base. Look immediately beneath the stage. A **condenser** gathers light from the light source and directs it through the opening in the stage. The **iris diaphragm**, which can be opened various degrees, regulates the amount of light passing through the specimen. Proper control of the amount of light passing through a specimen can greatly facilitate your studies. When looking at slides today, experiment with the iris diaphragm and the light source and note its effect on the detail you are able to see. Any change in objective or specimen may require lighting adjustment.

Steps to use a compound microscope:

1. Before each use, the ocular and objective lenses of the microscope should be cleaned with lens paper. Only lens paper should be used to clean the lenses—never tissues, paper towels, or any other material that might scratch the lenses. If the lenses are very dirty, a liquid lens cleaner may be used with the lens paper.
2. Rotate the nosepiece so that the lowest-power objective (4×) is in position.
3. Prepare the slide and place it on the stage with the coverslip facing upward. Steps on how to prepare a wet mount slide are found in the Cells Lab procedures. For this demonstration, a dry mount is used. Write the letter “e” on a small piece of paper and place it on a thick rectangular slide. The “e” should be centered over the opening in the stage. Make sure to secure the slide to the stage with the spring-loaded stage clip. Look through the ocular lens. The first goal is to get the slide in focus. To do this, raise the coarse adjustment knob while looking through the ocular until you see the slide. The image that you see is called the **field of view**. The lens system of the microscope causes the image in the field to appear to be upside down and backwards. So, through the microscope the letter looks like “ə” instead of “e.” This is always true of the compound microscope. When an

Notes:

organism you are watching swims out of the left field of view, you must actually move the slide in the opposite direction to follow it. Try to center the object you wish to see in the middle of the lens, because when you increase the magnification, the field of view becomes smaller. If it is better focused, it is easier to find.

4. Slowly rotate from the 4× objective to the next-highest objective (10×). You may not see the letter, and will need to refocus the lens. To do this, use the fine-adjustment knob. Once in focus, note that the letter now fills more of the area of the field that you see. The field also appears darker; you may need to increase the amount of light passing through the lens system. Thus, as the power increases, the brightness and area of the field on the slide decreases.
5. Now view the slide under the 40× objective, and note the change in the area and brightness of the field. Again use the fine-adjustment knob to bring it into focus and be aware that the slide is close to the lens. The slide should not touch the lens.

NOTES: Before changing slides, always rotate the lowest-power objective into position. Always view the slide under the lowest-power objective first and increase the power progressively.

Now view a slide of three colored silk threads. Use this to practice focusing. Again note the effects of varying magnification on the area of the field and the brightness of the image. Focus on an area where two strands overlap. Adjust the amount of light passing through the slide by adjusting the rheostat on the light or by changing the iris diaphragm. Notice that by adjusting the availability of light, one or both threads may appear to be in focus. The thickness of the area in focus is termed the **depth of focus**.

Notes:



6 Microscopes

Notes:



Cell Structures, Cell Cycle, and Mitosis

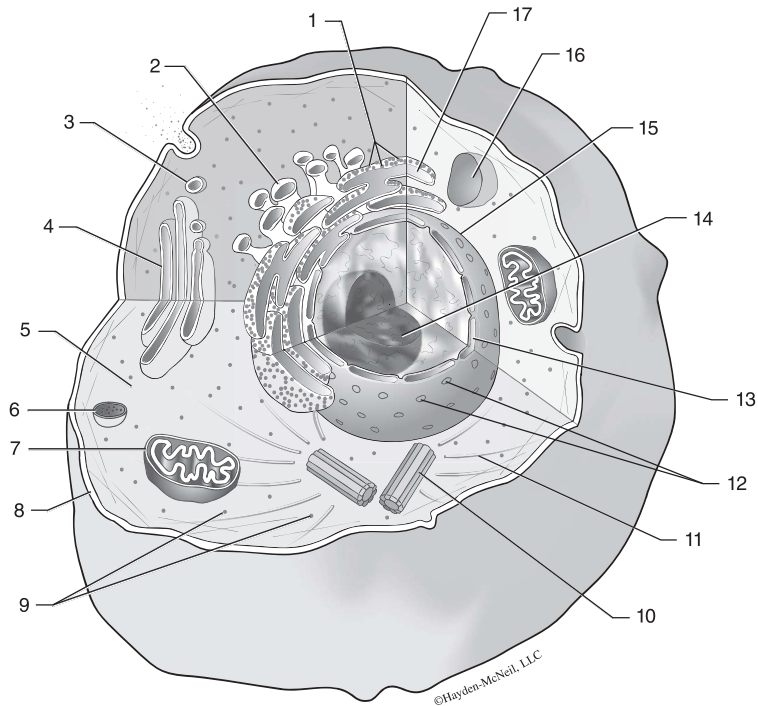
Introduction

The cell has been known to science ever since Robert Hooke first coined the term in 1665 to describe the repeated holes he observed in tree cork. Cells vary considerably in size and shape and our body contains trillions of them; however, they usually cannot be observed without the aid of a microscope. Each cell contains a plasma membrane as a peripheral border. The plasma membrane contains a variety of molecules and its activity should not be underestimated. Within the plasma membrane is a nucleus and cytoplasm. The nucleus has a double membrane called the nuclear envelope defining its border and contains our genetic material. The cytoplasm makes up the majority of the cell and contains unique structures called organelles which have specific functions. Lastly, cells have the incredible ability to make clones of themselves through a process we know as mitosis.

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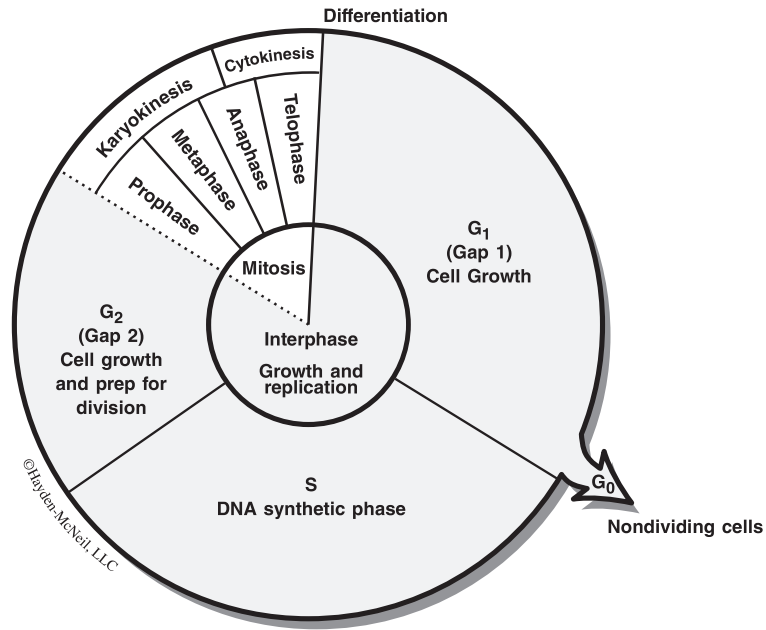
Basic Structure of an Animal Cell

1. Ribosome (fixed)
2. Smooth endoplasmic reticulum
3. Vesicle
4. Golgi complex
5. Cytoplasm
6. Peroxisome
7. Mitochondrion
8. Plasma membrane
9. Ribosome (free)
10. Centriole
11. Microtubule
12. Nuclear pore
13. Nuclear envelope
14. Nucleolus
15. Nucleus
16. Lysosome
17. Rough endoplasmic reticulum



Notes:

Cell Cycle



Notes:

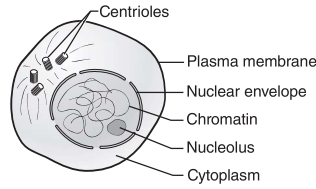
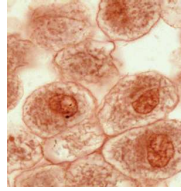


Interphase and Mitosis as Viewed Through a Light Microscope

Observe slides of the whitefish blastula. Learn to identify all of the phases and listed structures.

Notes:

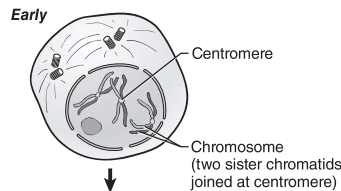
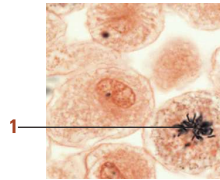
1. Chromosomes
2. Asters
3. Spindle fibers
4. Cleavage furrow



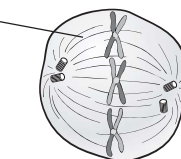
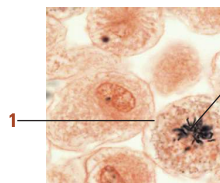
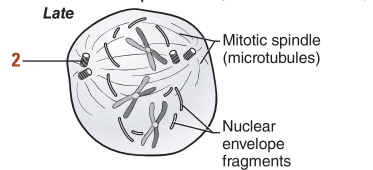
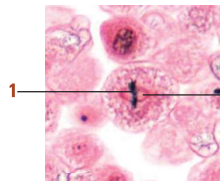
INTERPHASE

Interphase
Cells spend most of their time in interphase. During this phase, individual chromosomes cannot be distinguished in the nucleus of the cell. As a cell prepares to undergo division, the chromosomes duplicate themselves in this phase.

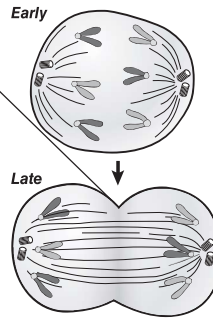
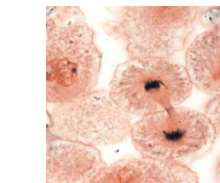
PHASES OF MITOSIS



Prophase
During prophase, the chromosomes condense and become visible in the nucleus. The nuclear membrane disappears and the chromosomes spread out in the cell. A microtubule framework within the cell, called a **spindle**, begins to form.

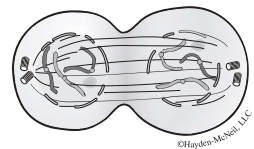


Metaphase
During metaphase, the chromosomes line up in the middle of the cell.



Anaphase
During anaphase, the two identical sets of chromosomes migrate along the spindle fibers to opposite ends of the cell.

Cleavage furrow marks the beginning of cytokinesis.




Telophase
The chromosomes uncoil and again become threadlike and indistinct. A nuclear membrane forms around each of the two sets of chromosomes clustered at opposite ends of the cell. Cytokinesis is occurring and a cleavage furrow is present.

Notes:



12 Cell Structures, Cell Cycle, and Mitosis

Notes:



Medical Terminology, Body Positions, and Organ Systems

Part A. Human Anatomical Terminology

The study of anatomy and physiology involves use of terminology with Latin (L) or Greek (G) origin. To facilitate the understanding of various terms, a list of common prefixes, suffixes, and endings signifying singular or plural follows. Some of those will be familiar since they are in everyday use. The list can be much longer since there are many more that are used in medicine and the medical field, but for the purposes of this manual, the presented list is sufficient. These common terms will be used throughout this first course of anatomy and physiology, and later in the second part of this two-semester sequence.

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14 Medical Terminology, Body Positions, and Organ Systems

Common Prefixes Used in Anatomy

PREFIX	ETYMOLOGY	MEANING	EXAMPLE
A-, AN-	G	LACK OF, APART FROM	ANEMIA, AVASCULAR
AB-	L	AWAY FROM	ABDUCT, ABORT
AD-	L	TOWARD, NEAR	ADDUCTION, ADRENAL
AMPHI-	G	AROUND, ON BOTH SIDES, IN TWO WAYS	AMPHIARTHROSIS
ANTE-	L	BEFORE, IN FRONT OF	ANTERIOR, ANTEMORTEM
ANTI-	G	AGAINST	ANTIBIOTIC, ANTIDIURETIC
BI-	L	TWO, TWICE	BICEPS, BIPOLAR
CIRCUM-	L	AROUND, SURROUNDING	CIRCUMDUCTION, CIRCUMOCULAR
COM-, CON-	L	TOGETHER, WITH	COMMISSURE, CONCENTRIC
CONTRA-	L	AGAINST, OPPOSITE	CONTRALATERAL, CONTRAINDICATION
DI-	G	TWICE, TWO	DIGASTRIC, DIPLOID
DIA-	G	THROUGH, ACROSS, BETWEEN, COMPLETELY	DIAPHYSIS, DIENCEPHALON
DIS-	G	AWAY FROM, APART, UNDO	DISSECT, DISASSEMBLE
E-, EC-, EX-, EXO-	L	OUT, AWAY FROM	EXHALE, EXCRETION, EVERSION, EXOSKELETON
EM-, EN-	G	IN, INTO, ON, WITHIN	EMBEDDED, ENDODERM
EPI-	G	UPON, OUTSIDE	EPIDERMIS, EPIGLOTTIS
HEMI-	L	HALF	HEMIDESMOSOME, HEMISPHERE
HYPER-	G	EXCESSIVE	HYPERTROPHY, HYPERTENSION
HYPO-	G	BELOW, DEFICIENCY	HYPOGASTRIC, HYPOTHERMIA
IM-, IN-	L	NOT, INTO	IMMATURE, INCISOR
INTER-	L	BETWEEN, TOGETHER	INTERVENE, INTERCOSTAL
INTRA-	L	WITHIN	INTRAVENOUS, INTRACELLULAR
MACRO-, MEGA-	G, L	LARGE, GREAT	MACROPHAGE, MEGALOMANIA
META-	G	BEYOND, AFTER	METATARSAL, METASTASIS
MICRO-	G	SMALL	MICROSCOPIC, MICROORGANISM
MONO-	L	ONE	MONOCYTE, MONOMER
PERI-	G	AROUND	PERIPHERY, PERICARDIUM

Notes:

Common Prefixes Used in Anatomy (cont.)

PREFIX	ETYMOLOGY	MEANING	EXAMPLE
POLI-	L	MANY	POLYGON, POLYMER
POST-	L	BEHIND, AFTER IN TIME	POSTERIOR, POSTMENOPAUSAL
PRE-, PRO-	L	BEFORE IN TIME, IN FRONT OF	PROPHASE, PREDECESSOR
SUB-	L	UNDER, BELOW	SUBCLAVICULAR, SUBSCAPULAR
SUPER-, SUPRA-	L	ABOVE, EXCESSIVE	SUPERIOR, SUPRACLAVICULAR
SYM-, SYN-	G	TOGETHER WITH	SYMPHYSIS, SYNARTHROSIS
TRANS-	L	THROUGH, ACROSS, BETWEEN, COMPLETELY	TRANSVERSE, TRANSPLANT
TRI-	L	THREE	TRICEPS, TRIGEMINAL

Common Suffixes Used in Anatomy

PREFIX	ETYMOLOGY	MEANING	EXAMPLE
-AC, -AL	G	PERTAINING TO	CARDIAC, NEURAL
-BLAST	G	SPROUT	CHONDROBLAST
-CYTE	G	CELL	CHONDROCYTE
-ECTOMY	G	SURGICAL REMOVAL	APPENDECTOMY
-GRAM, -GRAPH	G	RECORD, INSTRUMENT TO RECORD	ELECTROCARDIOGRAM, ELECTROCARDIOGRAPH
-LOGY	G	STUDY	BIOLOGY
-OID, -FORM	G	RESEMBLANCE	DELTOID, FUSIFORM
-OPSY	G	VIEW	BIOPSY
-SCOPE	G	INSTRUMENT TO VIEW	MICROSCOPE
-TOME	G	INSTRUMENT TO CUT	MICROTOME

Notes:

16 Medical Terminology, Body Positions, and Organ Systems

Singular and Plural Word Endings

SINGULAR	PLURAL	ETYMOLOGY	EXAMPLE
-A	-AE	L	VERTEBRA, VERTEBRAE
-AX	-ACES	G	THORAX, THORACES
-EN	-INA	L	FORAMEN, FORAMINA
-EX, -IX	-ICES	G	CORTEX, CORTICES; FORNIX, FORNICES
-IS	-ES	G	METASTASIS, METASTASES
-MA	-MATA	L	STOMA, STOMATA
-ON	-A	L	GANGLION, GANGLIA
-UM	-A	L	BACTERIUM, BACTERIA
-US	-I	L	MENISCUS, MENISCI
-US	-OR, -ERA	L	CORPUS, CORPORA
-X	-GES	G	MENINX, MENINGES

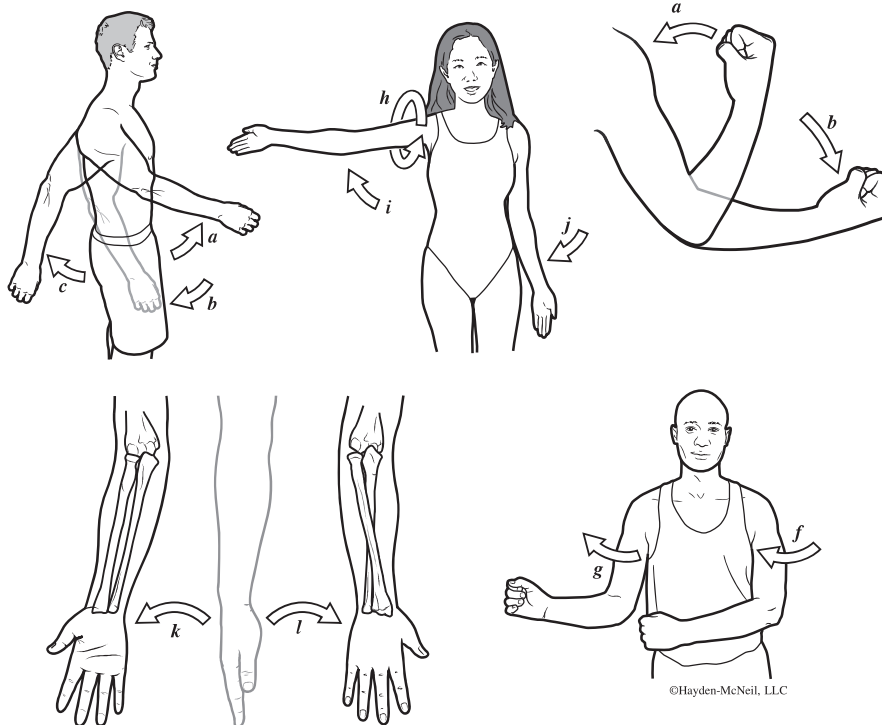
Notes:

Part B. Body Positions

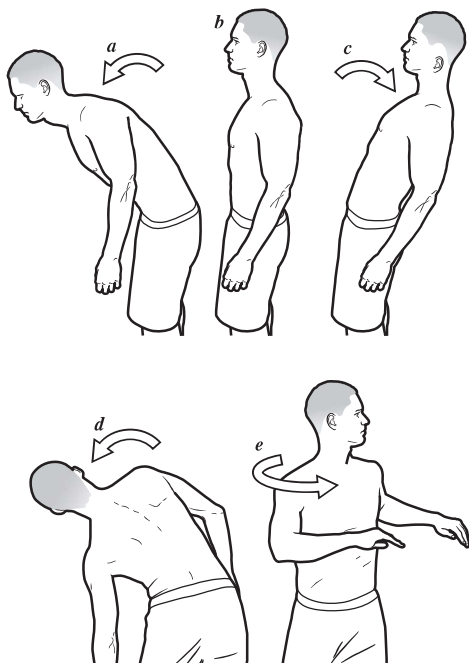
Arm movements

Movements 1

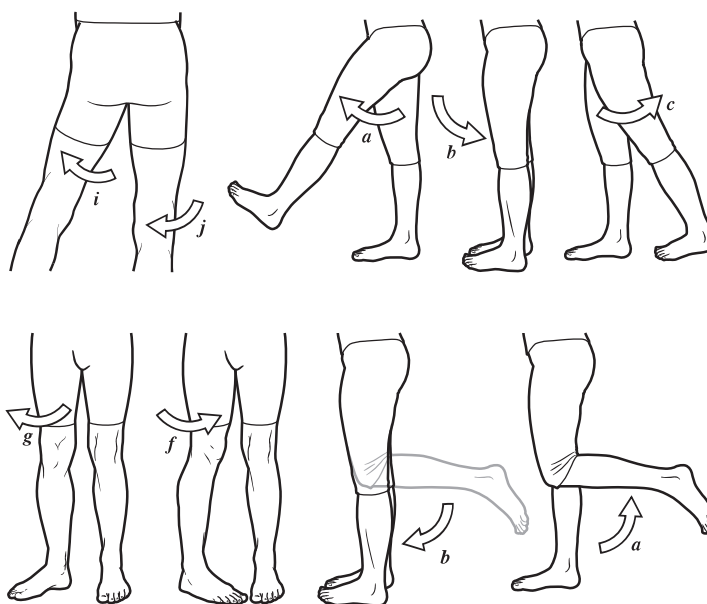
- (a) Flexion
- (b) Extension
- (c) Hyperextension
- (d) Lateral flexion
- (e) Rotation
- (f) Medial rotation
- (g) Lateral rotation
- (h) Circumduction
- (i) Abduction
- (j) Adduction
- (k) Supination
- (l) Pronation



Trunk movements



Leg movements



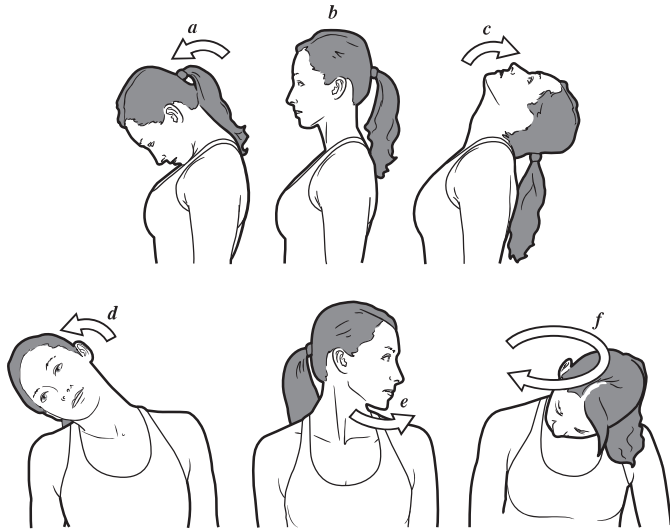
Movements 2

- (a) Flexion
- (b) Extension
- (c) Hyperextension
- (d) Lateral flexion
- (e) Rotation
- (f) Circumduction
- (g) Abduction
- (h) Adduction
- (i) Depression
- (j) Elevation
- (k) Protraction
- (l) Retraction
- (m) Dorsiflexion
- (n) Plantar flexion
- (o) Eversion
- (p) Inversion
- (q) Opposition of thumb

Shoulder movements

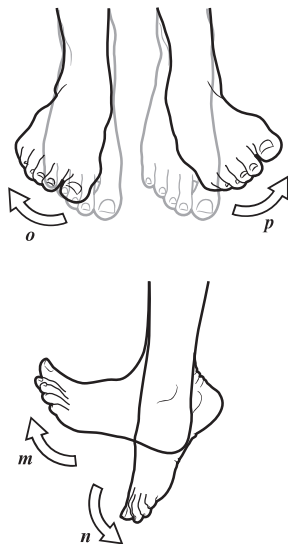


Neck movements

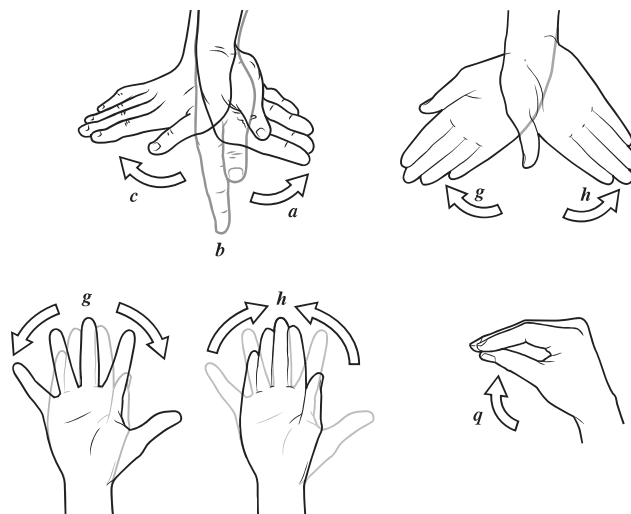


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Foot movements



Hand movements



Part C. Organ Systems Overview

Introduction

The study of anatomy and physiology requires the use of a standardized vocabulary to describe the structure and function of the human body. This standardized language allows effective communication among students, scientists, and health-care professionals. This common terminology is utilized globally to ensure the same structure or body part is being referenced correctly.

In this lab, you will become familiar with the language of anatomy and its possible applications. You will discover that this standardized language will be used throughout your study of anatomy and physiology. In addition, you will learn about the organ systems and associated structures of the human body.

Anatomical Position and Anatomical Terms for Specific Body Regions

A. Using your textbook as a reference, define anatomical position.

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Notes:

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B. Label Figures 2 and 3 using the correct anatomical term from the list provided for each diagram.

- | | | | |
|----------|--------------------|-------------|------------------|
| FEMORAL | ACROMIAL | ORBITAL | ABDOMINAL |
| INGUINAL | MAMMARY | STERNAL | PEDAL |
| COXAL | ANTEBRACHIAL | PECTORAL | CRURAL |
| NASAL | CARPAL | UMBILICAL | TARSAL |
| BUCCAL | PALMAR | PATELLAR | CEPHALIC/CRANIAL |
| MENTAL | PHALANGEAL/DIGITAL | AXILLARY | |
| ORAL | GENITAL | BRACHIAL | |
| CERVICAL | FRONTAL | ANTECUBITAL | |

1.	16.
2.	17.
3.	18.
4.	19.
5.	20.
6.	21.
7.	22.
8.	23.
9.	24.
10.	25.
11.	26.
12.	27.
13.	28.
14.	29.
15.	

Notes:

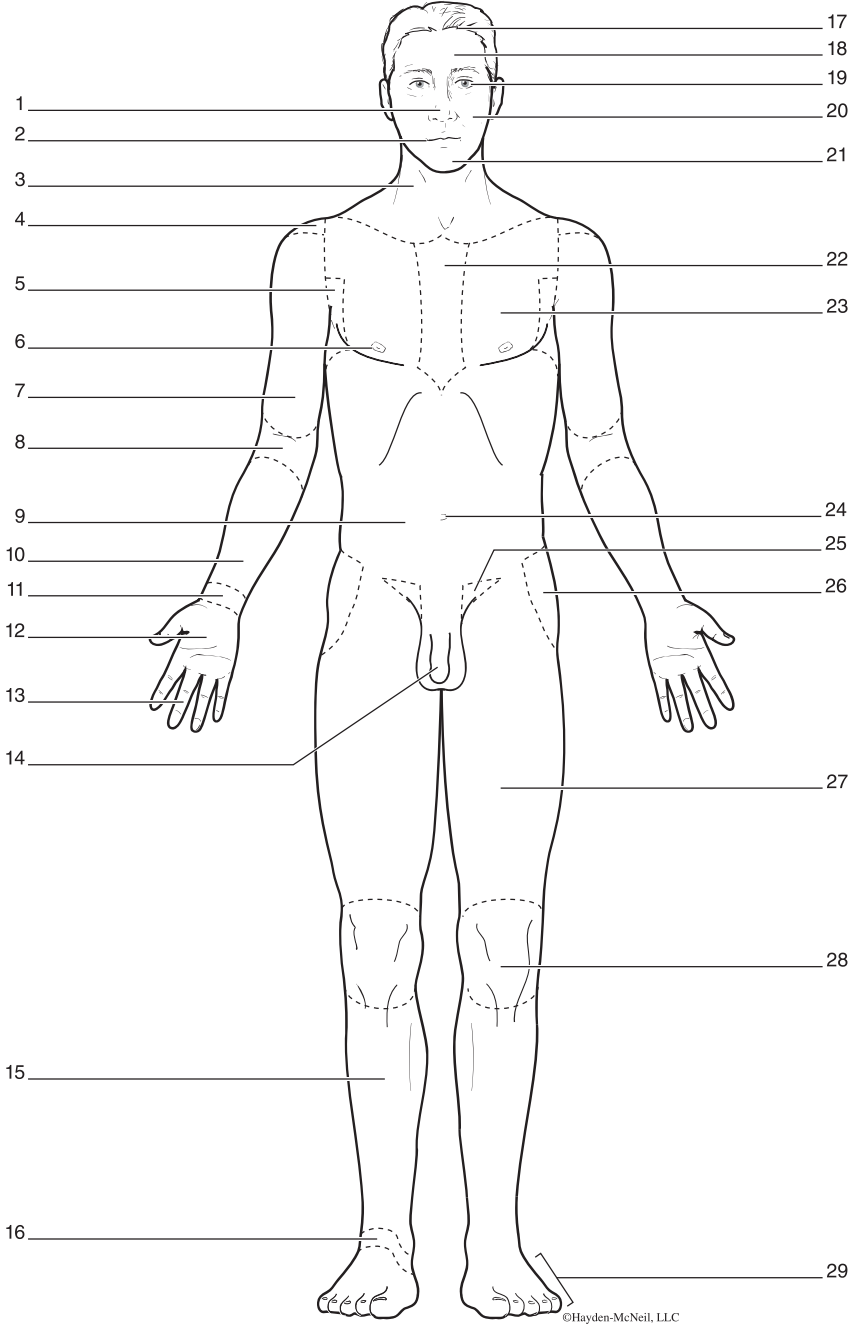


Figure 2. Anatomical terms and body regions (anterior view)

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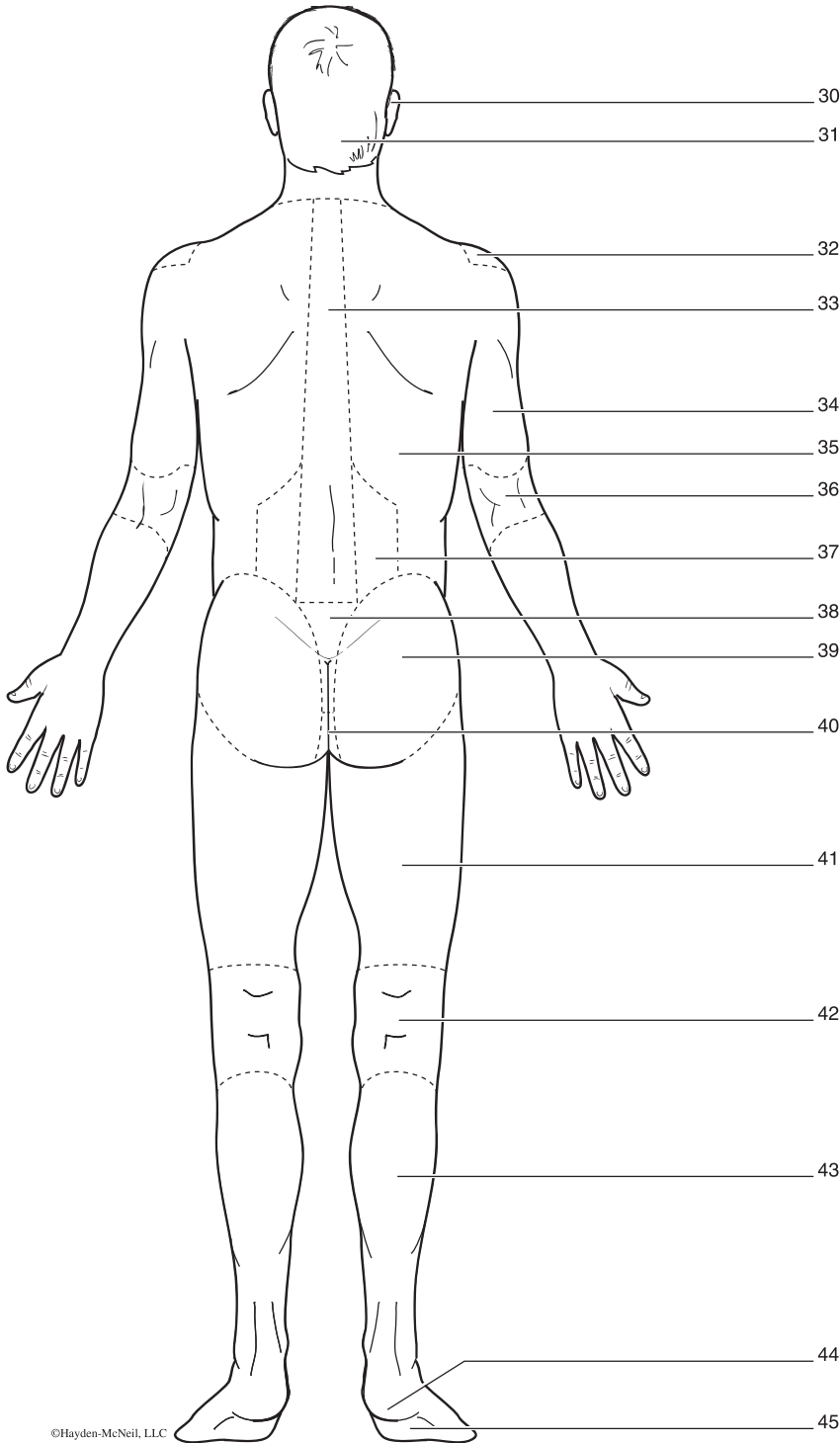
OCCIPITAL
 OTIC
 FEMORAL
 POPLITEAL
 SURAL
 ACROMIAL

VERTEBRAL
 BRACHIAL
 DORSAL
 SACRAL
 GLUTEAL
 PERINEAL

OLECRANAL
 PLANTAR
 CALCANEAL
 LUMBAR

30.	38.
31.	39.
32.	40.
33.	41.
34.	42.
35.	43.
36.	44.
37.	45.

Notes:



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Figure 3. Anatomical terms and body regions (posterior view)

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Relative Position of Body Parts and Directional Terms

- A. Refer to Table 1 for directional terms and their definitions. You will use this information to complete Section B.

Table 1. Directional Terms

DIRECTIONAL TERM	DEFINITION
SUPERIOR	TOWARD THE HEAD, OR THE UPPER PART OF A STRUCTURE
INFERIOR	AWAY FROM THE HEAD, OR THE LOWER PART OF A STRUCTURE
ANTERIOR	NEARER TO OR AT THE FRONT OF THE BODY
POSTERIOR	NEARER TO OR AT THE BACK OF THE BODY
MEDIAL	NEARER TO THE MIDLINE
LATERAL	FARTHER FROM THE MIDLINE
INTERMEDIATE	BETWEEN TWO STRUCTURES
IPSILATERAL	ON THE SAME SIDE OF THE BODY AS ANOTHER STRUCTURE
CONTRALATERAL	ON THE OPPOSITE SIDE OF THE BODY FROM ANOTHER STRUCTURE
PROXIMAL	CLOSER TO THE TRUNK OR POINT OF ATTACHMENT
DISTAL	FARTHER FROM THE TRUNK OR POINT OF ATTACHMENT
SUPERFICIAL	TOWARD OR ON THE SURFACE OF THE BODY
DEEP	AWAY FROM THE SURFACE OF THE BODY

- B. Complete the following sentences using the correct directional term. Unless otherwise noted, assume the body is in the anatomical position. You may wish to use your textbook to help you locate some of the following organs and structures.
- The heart is _____ to the diaphragm. (superior/inferior)
 - The chest is _____ to the spine. (anterior/posterior)
 - The nose is _____ to the eyes. (medial/lateral)
 - The gallbladder is _____ to the stomach. (intermediate/ipsilateral/contralateral)
 - The foot is _____ to the knee. (proximal/distal)
 - The lungs are _____ to the ribs. (superficial/deep)

Notes:

Planes and Sections of the Human Body

- A. A **plane** is an imaginary flat surface that passes through the body or body part. A **section** is a cut of the body or body part made along a specific plane. Refer to Table 2 for the definitions of the different planes and sections that can pass through the body. You will use this information to complete Section B.

Table 2. Body Planes and Sections

PLANE/SECTION	DEFINITION
SAGITTAL	DIVIDES THE BODY OR AN ORGAN INTO RIGHT AND LEFT SIDES
MIDSAGITTAL	DIVIDES THE BODY OR AN ORGAN INTO EQUAL RIGHT AND LEFT SIDES
PARASAGITTAL	DIVIDES THE BODY OR AN ORGAN INTO UNEQUAL RIGHT AND LEFT SIDES
FRONTAL (CORONAL)	DIVIDES THE BODY OR AN ORGAN INTO ANTERIOR AND POSTERIOR PORTIONS
TRANSVERSE (CROSS SECTION)	DIVIDES THE BODY OR AN ORGAN INTO SUPERIOR AND INFERIOR PORTIONS
OBLIQUE	PASSES THROUGH THE BODY OR AN ORGAN AT AN ANGLE

- B. Label Figures 4 and 5 using the correct plane or section from Table 2.

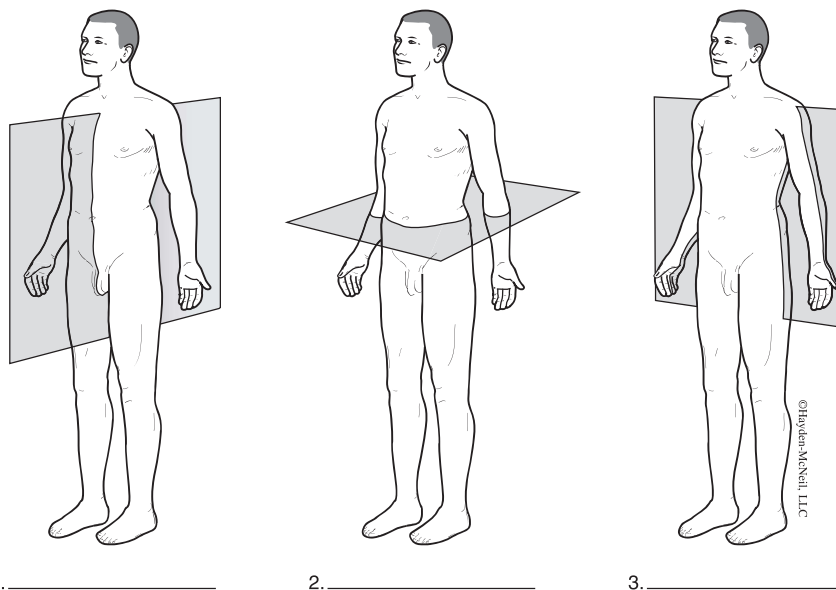


Figure 4. Body planes

Notes:

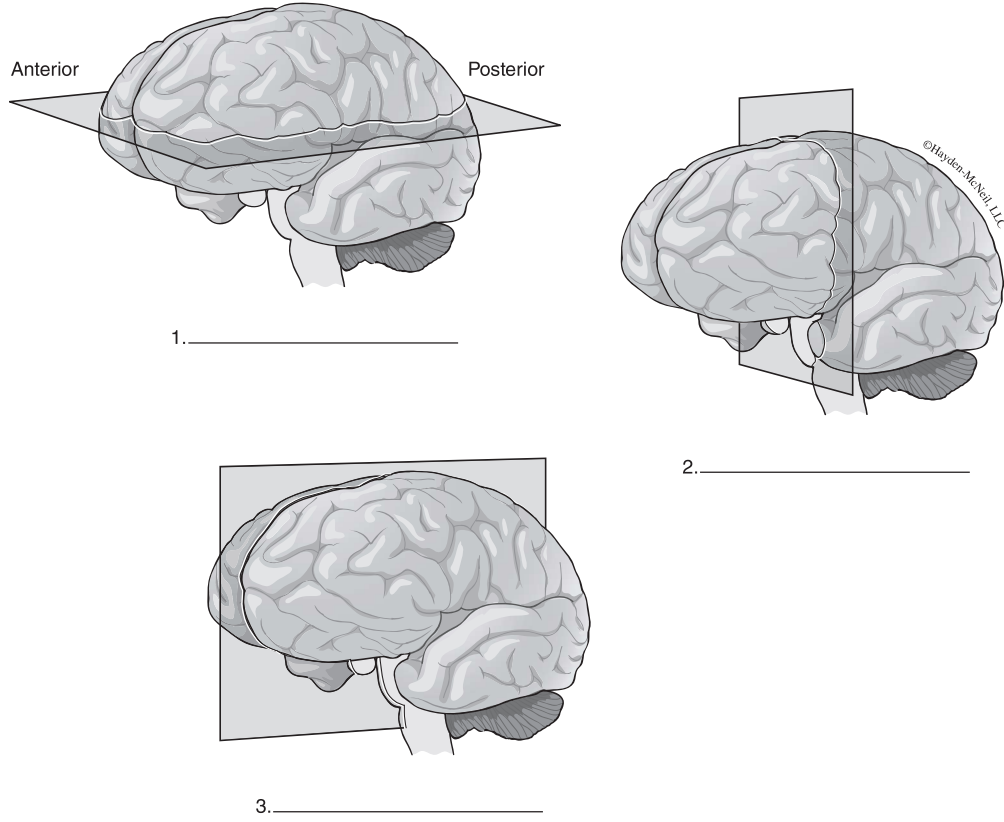


Figure 5. Sections of the brain

Notes:

Body Cavities

A. Body cavities are spaces inside the body that contain, support, and protect internal organs. Label Figures 6 and 7 using the correct anatomical term from the list provided for each diagram.

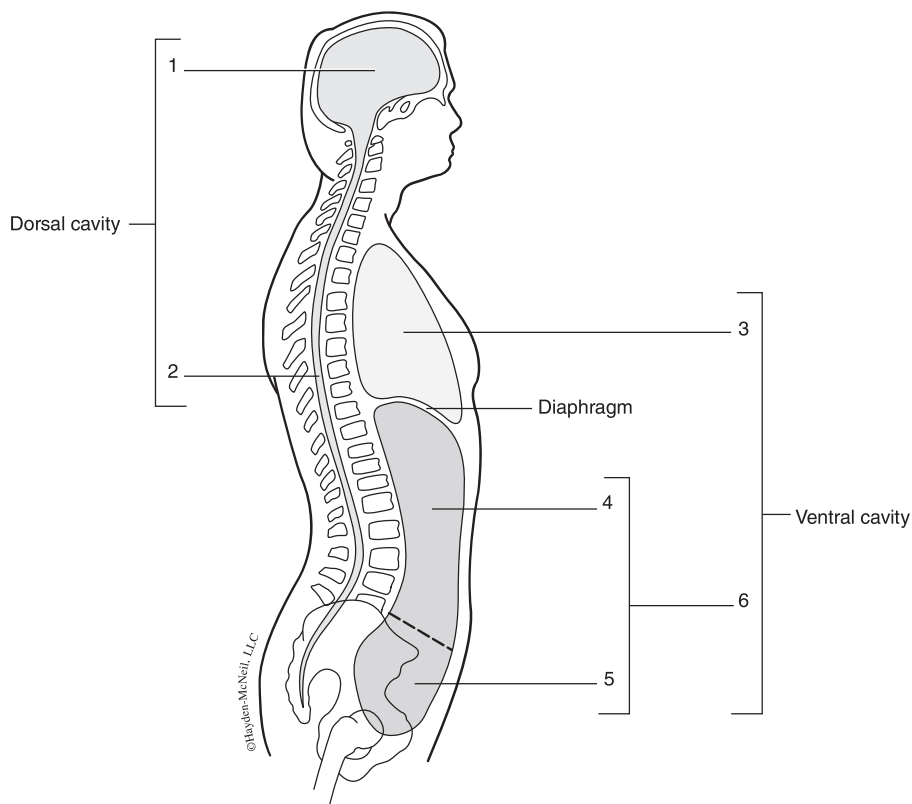


Figure 6. Major body cavities (lateral view)

CRANIAL
VERTEBRAL/SPINAL

THORACIC
ABDOMINAL

PELVIC
ABDOMINOPELVIC

1.	4.
2.	5.
3.	6.

Notes:

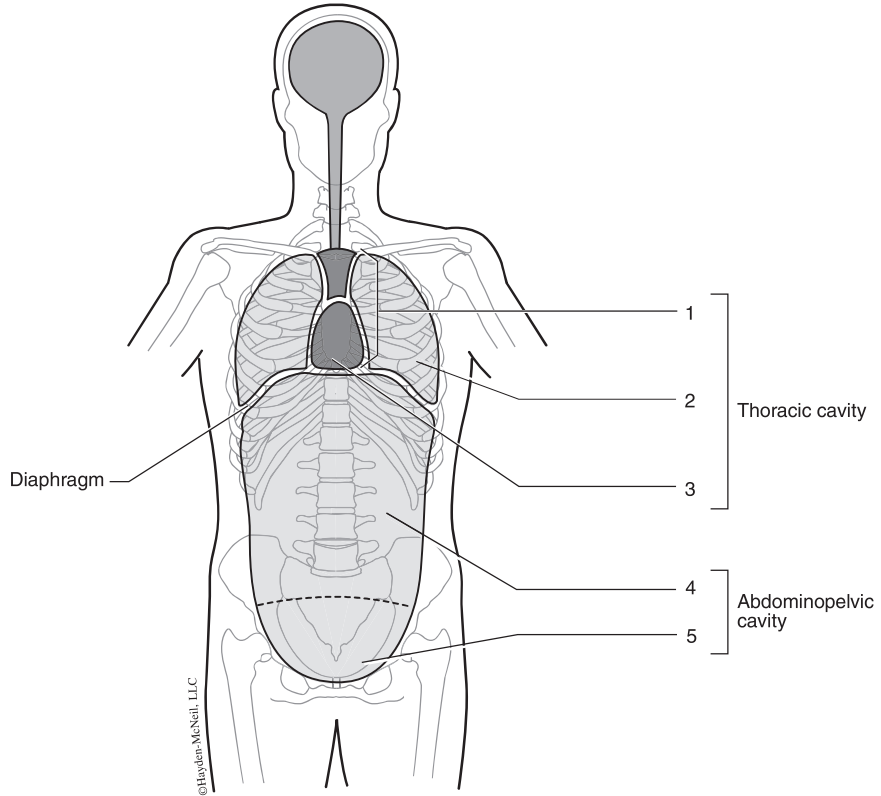


Figure 7. Body cavities (anterior view)

PLEURAL CAVITY
MEDIASTINUM

PERICARDIAL CAVITY
ABDOMINAL CAVITY

PELVIC CAVITY

1.	4.
2.	5.
3.	

Notes:

Membranes

A. Membranes are thin sheets of tissue that cover an organ or line a body cavity. **Serous membranes** line body cavities which do not open directly to the outside of the body and cover organs contained within the cavities. The term **parietal** is used to describe the serous membrane that lines the cavity wall. The term **visceral** is used to describe the serous membrane that covers the surface of organs within the cavity itself. Serous membranes produce a thin, watery secretion, called **serous fluid**, that acts as a lubricant to reduce friction between organs and the walls of body cavities. Label Figures 8, 9, and 10 using the correct anatomical term from the list provided for each diagram.

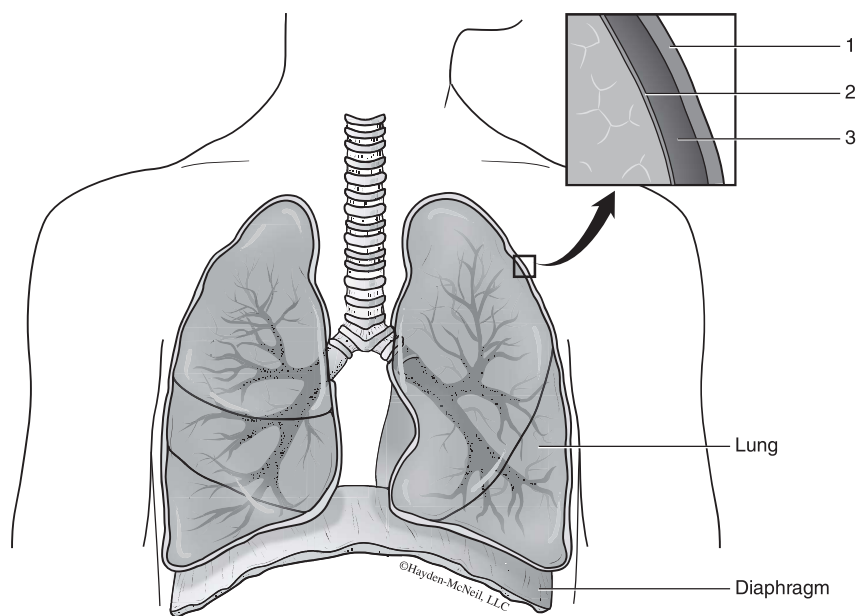


Figure 8. Frontal section of the pleural cavities

PARIETAL PLEURA	PLEURAL CAVITY	VISCERAL PLEURA
1.		3.
2.		

Notes:

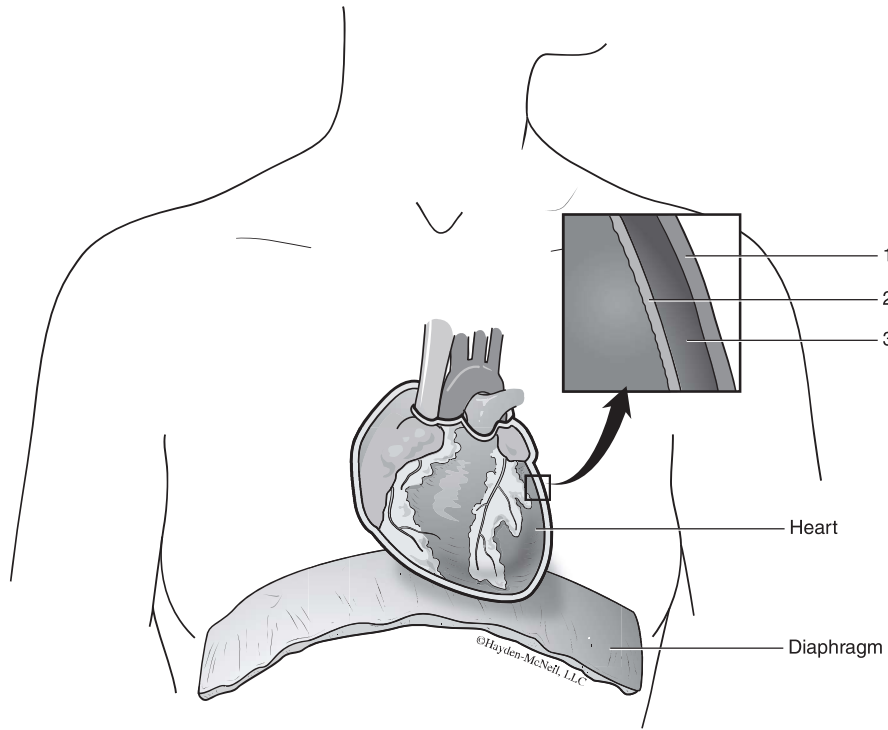


Figure 9. Frontal section of the pericardial cavity

PARIETAL PERICARDIUM	PERICARDIAL CAVITY	VISCERAL PERICARDIUM
1.		3.
2.		

Notes:

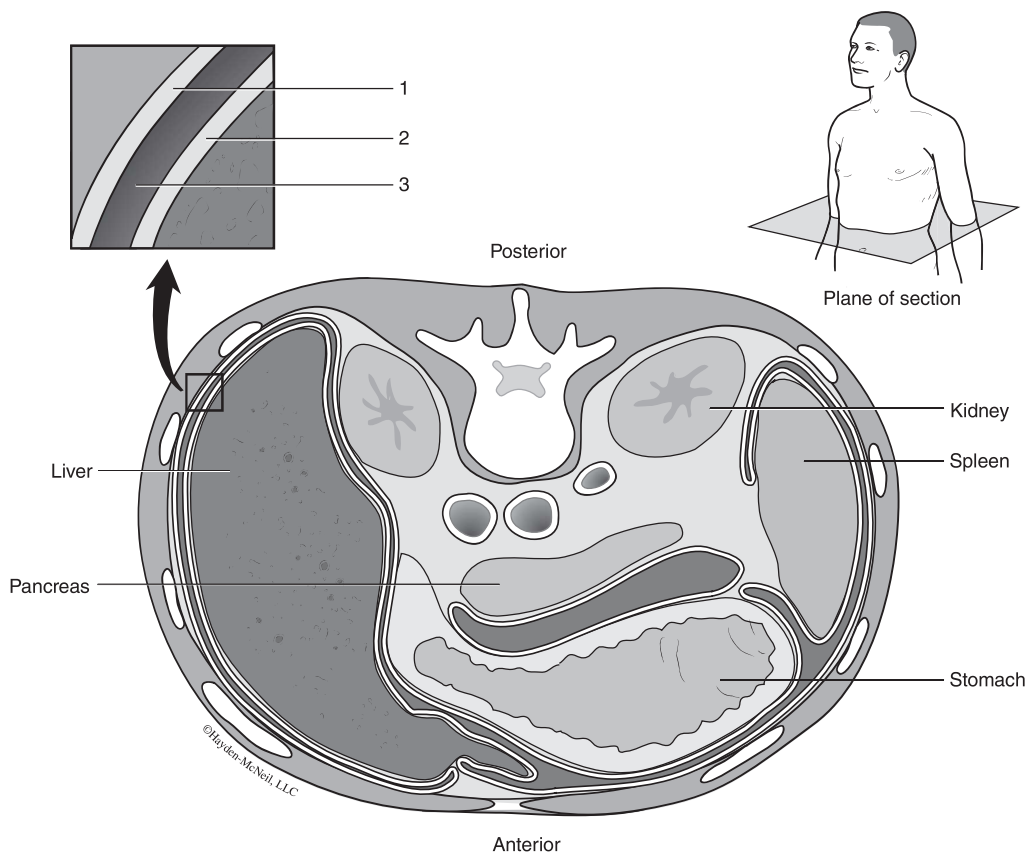


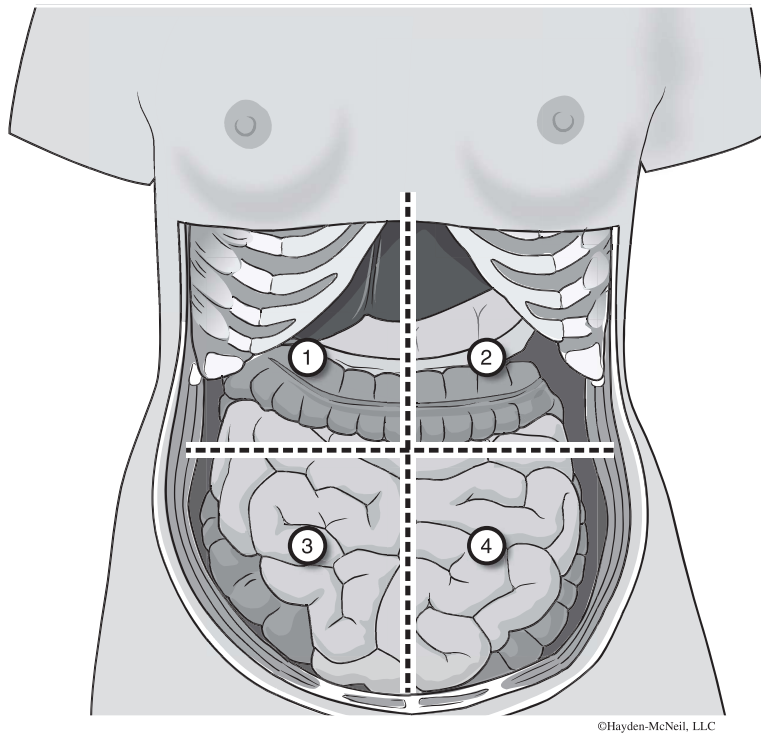
Figure 10. Transverse section of the abdominal cavity

PARIETAL PERITONEUM	PERITONEAL CAVITY	VISCERAL PERITONEUM
1.		3.
2.		

Notes:

Abdominal Quadrants and Regions

- A. To describe the location of abdominal and pelvic organs more specifically, anatomists and clinicians divide the abdominopelvic cavity into smaller areas called quadrants and regions. The four quadrants are often used by health-care professionals to describe the site of abdominopelvic pain, tumors, or other abnormalities. The nine regions are more commonly used for anatomical studies. Label Figures 11 and 12 using the correct anatomical term from the list provided for each diagram.



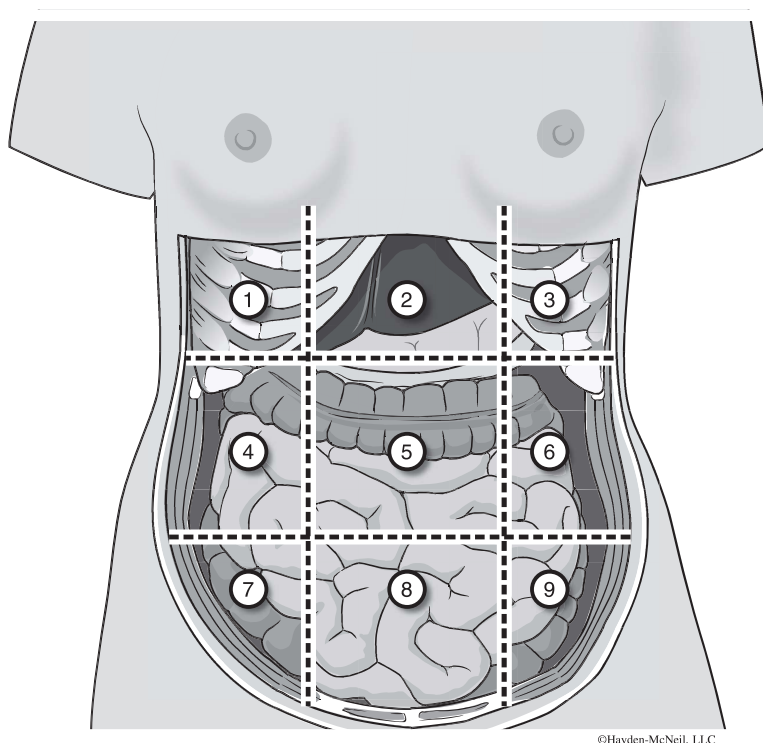
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Figure 11. Abdominopelvic quadrants

RIGHT UPPER QUADRANT (RUQ) LEFT UPPER QUADRANT (LUQ)
 RIGHT LOWER QUADRANT (RLQ) LEFT LOWER QUADRANT (LLQ)

1.	3.
2.	4.

Notes:



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Figure 12. Abdominopelvic regions

- | | | |
|----------------------------|-------------------------------|------------------------------|
| EPIGASTRIC REGION | RIGHT HYPOCHONDRIC REGION | LEFT HYPOCHONDRIC REGION |
| UMBILICAL REGION | RIGHT LUMBAR REGION | LEFT LUMBAR REGION |
| HYPOGASTRIC (PUBIC) REGION | RIGHT INGUINAL (ILIAC) REGION | LEFT INGUINAL (ILIAC) REGION |

1.	6.
2.	7.
3.	8.
4.	9.
5.	

Notes:

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Location of Major Organs in the Cavities of the Human Body

- A. An **organ** consists of several tissues working together to perform a specific function. To help you begin to familiarize yourself with the cavities and major organs of the human body, you will be asked to identify the following structures on the human torso model. You may wish to refer to diagrams in your textbook to help you locate the structures. However, if you have difficulty locating any of the structures, do not hesitate to ask your instructor for help.

Cranial Cavity

1. Brain

Thoracic Cavity (includes mediastinum, pleural, and pericardial cavities)

1. Heart
2. Lungs
3. Trachea
4. Esophagus

Abdominopelvic Cavity (includes abdominal and pelvic cavities)

1. Stomach
2. Spleen
3. Liver
4. Gallbladder
5. Small intestine
6. Large intestine
7. Urinary bladder
8. Pancreas
9. Kidneys
10. Adrenal gland

Notes:

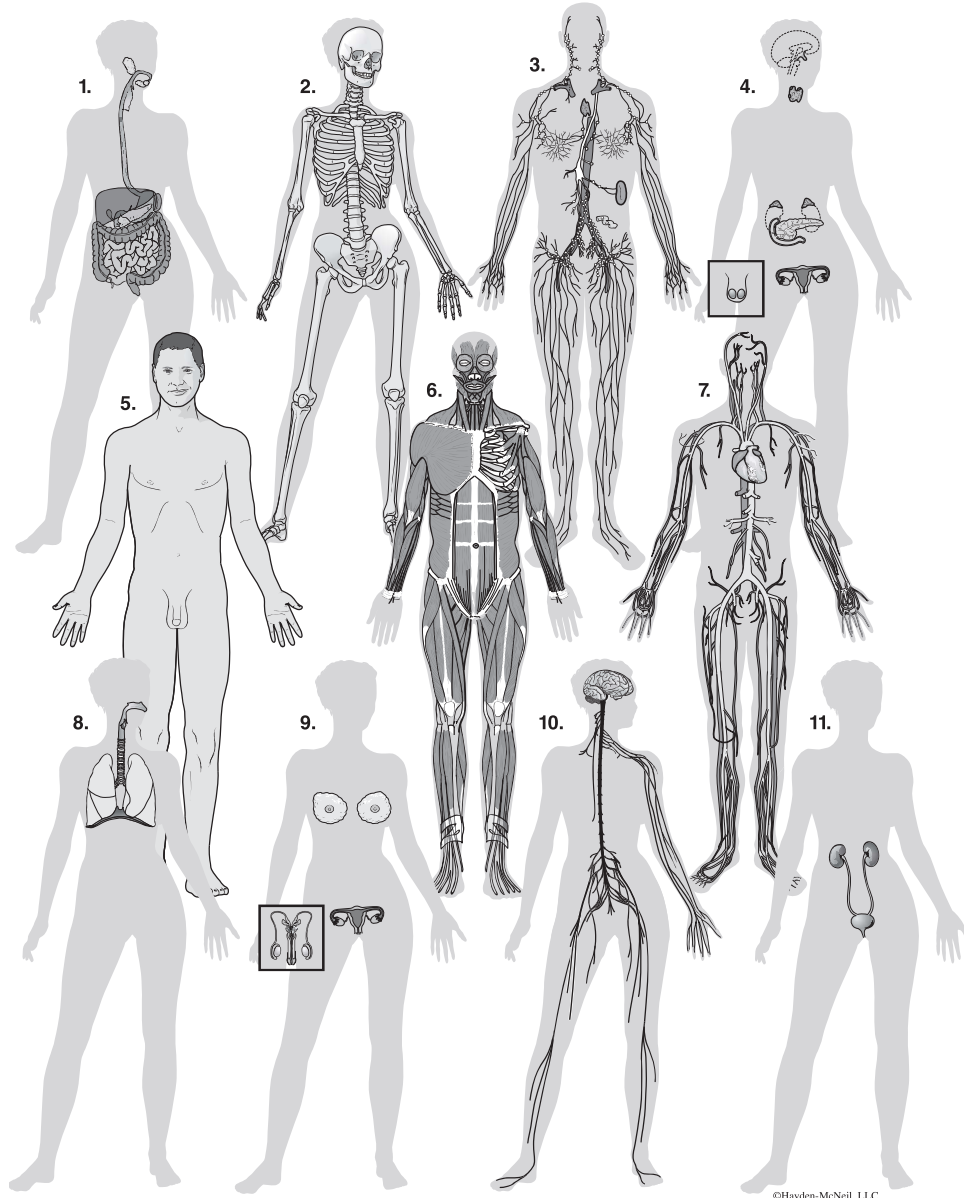
Major Organ Systems of the Human Body

A **system** consists of related organs working together to perform a common function. Complete Table 3 by summarizing the functions of the eleven organ systems. Later in the course you will learn about each system in much greater detail.

Table 3. The Eleven Organ Systems of the Human Body

ORGAN SYSTEM	FUNCTION(S)
INTEGUMENTARY SYSTEM	
SKELETAL SYSTEM	
MUSCULAR SYSTEM	
NERVOUS SYSTEM	
ENDOCRINE SYSTEM	
CARDIOVASCULAR SYSTEM	
LYMPHATIC SYSTEM	
RESPIRATORY SYSTEM	
DIGESTIVE SYSTEM	
URINARY SYSTEM	
REPRODUCTIVE SYSTEM	

Notes:



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Notes:
