



**Unit 1 Worksheets:
The Musculoskeletal System**



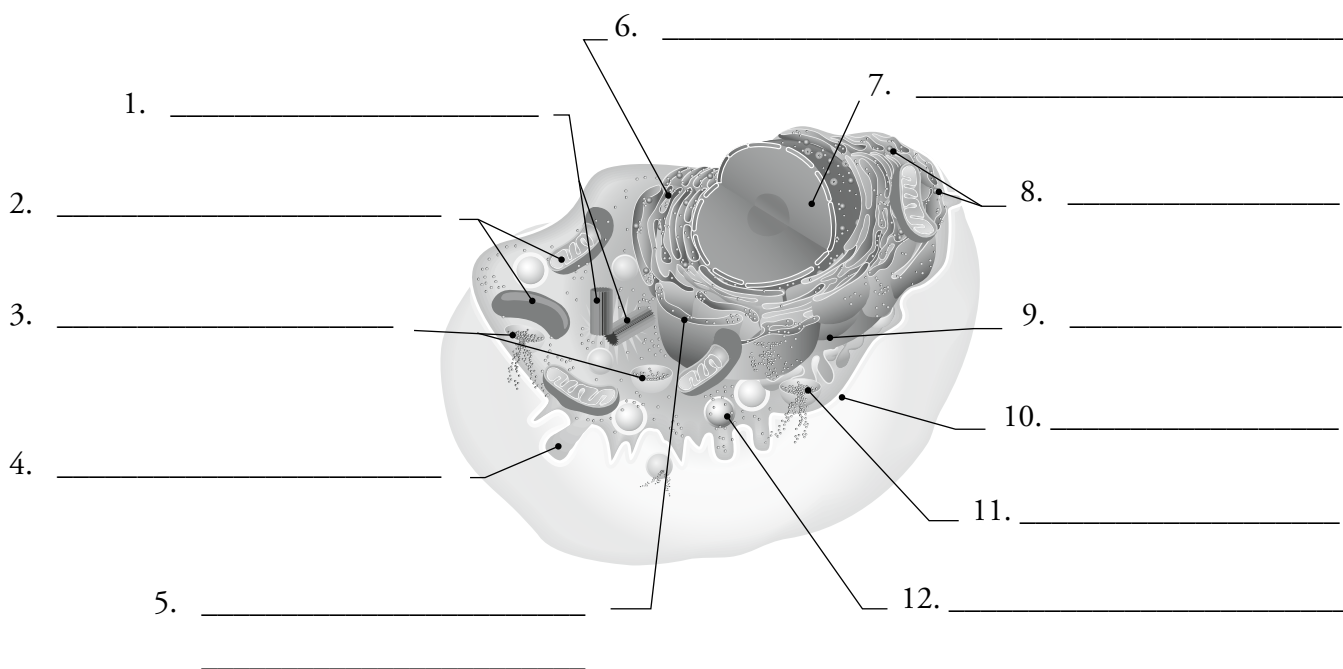
Words to Know: Define the Following:

1. Cells: _____
2. Anatomy: _____
3. Physiology: _____
4. Organs: _____
5. Digestive system: _____
6. Nucleus: _____
7. Cell membrane: _____
8. Cytoplasm: _____
9. Erythrocytes: _____

Fill in the Blank

1. The bones in the skeleton cannot remain strong without _____, which is manufactured by the skin.
2. There are over _____ different kinds of cells in the human body.
3. Psalm _____ says, “I will praise You, for I am fearfully and wonderfully made; marvelous are Your works.”
4. Just as words are built of letters and books are built from words, so your body is built of organs and tissues, and all the organs and tissues are made of _____.
5. The study of microscopic anatomy is called _____.
6. Physiology of the circulatory system focuses on how the _____ works.
7. Cells are small but not _____.
8. Groups of cells form tissues, which can be thought of as one of four basic tissue types — epithelial, connective, muscle, and _____.
9. The cell is the smallest “_____ unit” of the body.
10. Most cells have three basic parts — a nucleus, a cell membrane, and _____.

Complete the Chart — Human Cell Structure





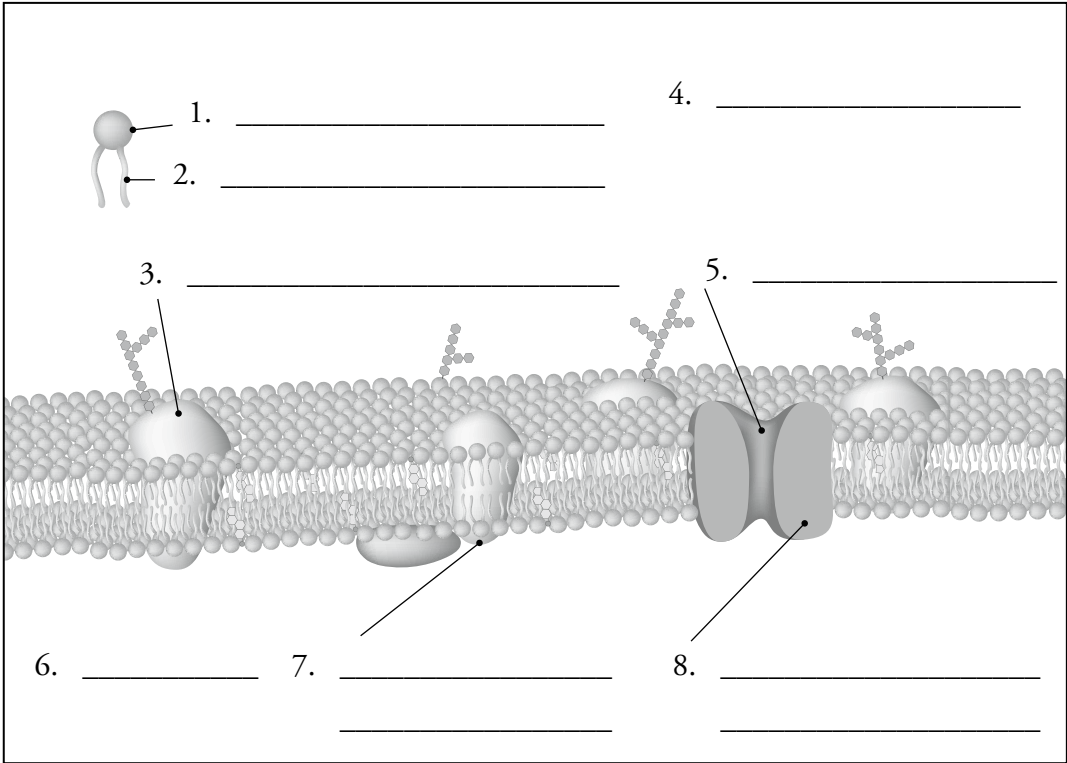
Words to Know: Define the Following:

1. Plasma membrane: _____
2. Intracellular fluid: _____
3. Extracellular fluid: _____
4. Water soluble: _____
5. Lipid: _____
6. Hydrophilic: _____
7. Hydrophobic: _____
8. Exocytosis: _____
9. Cytosol: _____
10. Lysosomes: _____

Fill in the Blank

1. The plasma _____ is far more than just a container, for it helps separate the two major fluid compartments of the body, the intracellular fluid and the extracellular fluid.
2. The plasma membrane is actually made up of two layers of molecules called _____.
3. The plasma membrane is composed of two layers of phospholipids, creatively called a phospholipid _____, which means “two layers of phospholipids.”
4. The cytosol plus the organelles make up the _____.
5. _____ acids are the building blocks of proteins.
6. The _____ reticulum is a network of tubes and membranes that is connected to the nuclear membrane.
7. The _____ apparatus is a collection of small flattened sacs that stack on one another.
8. _____ break down worn-out organelles, bacteria, and toxic substances.
9. Lysosomes also aid the cell by breaking down substances the cell needs for _____.
10. By breaking down organelles that are worn out or no longer needed, the lysosomes _____ valuable materials.

Complete the Chart — Plasma Membrane Structure





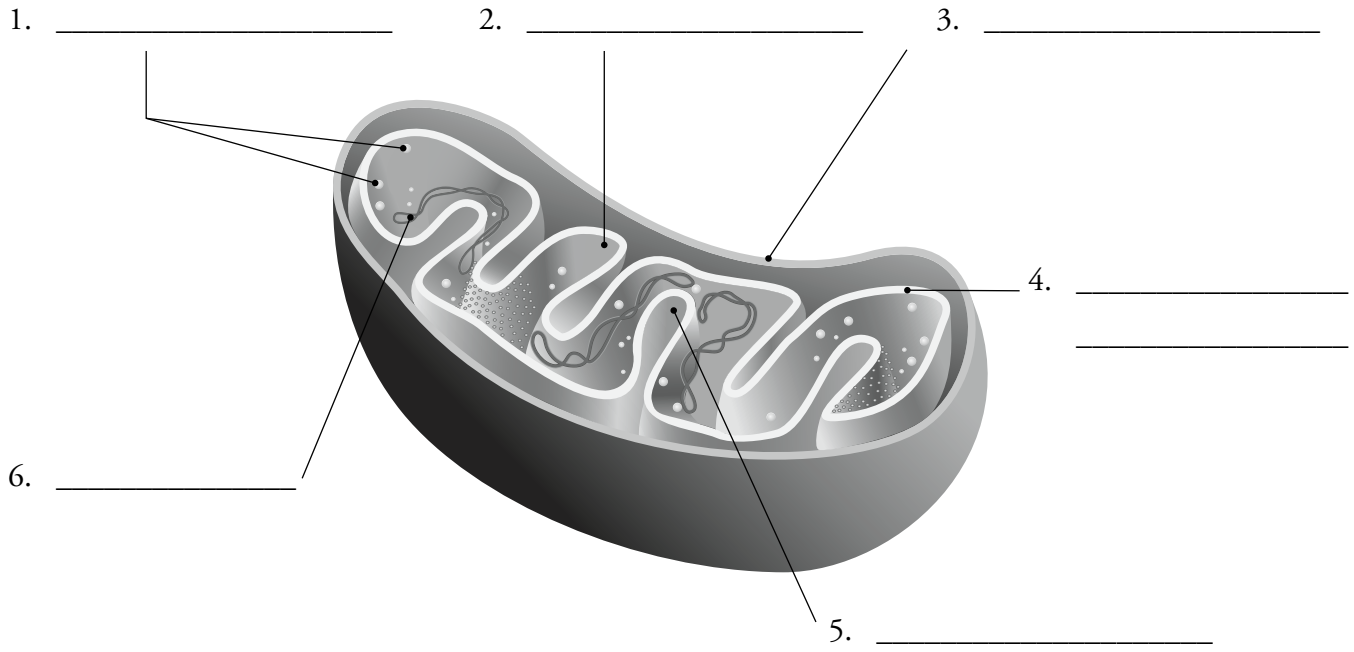
Words to Know: Define the Following:

1. Messenger RNA: _____
2. Mitochondria: _____
3. Metabolize: _____
4. Cytoskeleton: _____
5. Centrioles: _____
6. Mitotic spindle: _____
7. DNA (deoxyribonucleic acid): _____
8. Gene: _____
9. Enzymes: _____
10. Antibodies: _____

Fill in the Blank

1. _____ are where proteins are made.
2. The instructions for what the cell is supposed to do are stored in the _____.
3. Protein-making ribosomes are located in the _____.
4. The mitochondria are responsible for producing _____-energy molecules.
5. ADP, adenosine diphosphate, is like a battery that needs to be _____.
6. The cell's favorite fuel is not wood or gasoline but the sugar _____.
7. The number of mitochondria in a cell depends on the _____ needs of the cell.
8. DNA is a big molecule made up of two long strings of smaller molecules called _____.
9. Each double helix molecule of DNA is carefully organized and packaged into a _____.
10. DNA is a complex system of information that is used primarily to make the _____ in our body.

Complete the Chart — Mitochondria



Answer Keys
for Use with
Introduction to
Anatomy & Physiology
Volume 1

The Musculoskeletal System — Worksheet Answer Keys

Worksheet 1

Words to Know: Define the Following:

1. **Cells:** the building blocks of life
2. **Anatomy:** the study of the body's parts and how they are put together
3. **Physiology:** the study of how the parts of the body function; the study of how everything in the body works
4. **Organs:** groups of tissues that have a particular function
5. **Digestive system:** all the parts that process your food — from your mouth and stomach to your liver and intestines
6. **Nucleus:** the control center of the cell; it contains DNA
7. **Cell membrane:** forms the cell's outer border
8. **Cytoplasm:** most of the cell's work gets done here
9. **Erythrocytes:** red blood cells; their main job is to carry oxygen

Fill in the Blank

1. vitamin D
2. 200
3. 139:14
4. cells
5. histology
6. heart
7. simple
8. nervous
9. functional
10. cytoplasm

Complete the Chart — Human Cell Structure

1. Centrioles
2. Mitochondria
3. Peroxisome
4. Secretory vesicle
5. Smooth endoplasmic reticulum

6. Rough endoplasmic reticulum
7. Nucleus
8. Ribosomes
9. Golgi complex
10. Plasma membrane
11. Lysosome
12. Vesicle

Worksheet 2

Words to Know: Define the Following:

1. **Plasma membrane:** the envelope that contains the other components of the cell
2. **Intracellular fluid:** fluid inside the cells
3. **Extracellular fluid:** fluid that is outside the cells
4. **Water soluble:** something that can dissolve in water
5. **Lipid:** another name for a fat
6. **Hydrophilic:** a word that literally means “water-loving”
7. **Hydrophobic:** a word that literally means “water-fearing”
8. **Exocytosis:** the process of releasing material from inside the cell
9. **Cytosol:** the liquid found inside the cell
10. **Lysosomes:** small vesicles containing enzymes that can digest many kinds of molecules and debris

Fill in the Blank

1. membrane
2. phospholipids
3. bilayer
4. cytoplasm
5. Amino
6. endoplasmic
7. Golgi
8. Lysosomes
9. nutrition

10. recycle

Complete the Chart — Plasma Membrane Structure

1. Phospholipid head
2. Phospholipid tail
3. Transmembrane glycoprotein
4. Extracellular fluid
5. Pore
6. Cytoplasm
7. Transmembrane protein
8. Channel protein

Worksheet 3

Words to Know: Define the Following:

1. **Messenger RNA:** copies of the protein-building instructions from the nucleus
2. **Mitochondria:** they generate and store energy
3. **Metabolize:** a controlled way of “burning” the fuel of the body
4. **Cytoskeleton:** composed of a network of tubes and filaments that run throughout the cell
5. **Centrioles:** responsible for helping form a complex of microtubules
6. **Mitotic spindle:** guides the cell’s chromosomes during cell division
7. **DNA (deoxyribonucleic acid):** stores the genetic instructions needed to make all the proteins in the body
8. **Gene:** each section of DNA that has the information for a particular protein
9. **Enzymes:** perform all the chemical reactions in your cells
10. **Antibodies:** fight infectious invaders in your body

Fill in the Blank

1. Ribosomes
2. nucleus
3. cytoplasm
4. high
5. recharged

6. glucose

7. energy

8. nucleotides

9. chromosome

10. proteins

Complete the Chart — Mitochondria

1. Ribosomes
2. Matrix
3. Outer membrane
4. Inner membrane
5. Cristae
6. DNA

Worksheet 4

Words to Know: Define the Following:

1. **Junk DNA:** once thought to be merely left over from our evolutionary past, though they actually are quite active and serve many functions
2. **Interphase:** the part of the cell cycle when a cell is not actually splitting into two cells
3. **Chromatid:** duplicated chromosomes stuck together during interphase
4. **Pair of sister chromatids:** a chromosome and its copy, stuck together
5. **Mitosis:** the part of the cell cycle that is directly involved with dividing the cell into two daughter cells
6. **Tissue:** a group of cells that perform similar or related functions
7. **Epithelial tissue:** lines your body cavities or covers surfaces
8. **Glandular epithelium:** this tissue forms the glands of the body
9. **Myofilaments:** muscle cells contain these structures that allow the cells to contract
10. **Connective tissue:** helps provide a framework for the body, and helps connect and support other organs in the body

Fill in the Blank

1. Designer

2. interphase
3. prophase
4. Metaphase
5. anaphase
6. telophase
7. DNA
8. nervous
9. movement
10. collagen

Complete the Chart — DNA Replication

1. Parent DNA
2. DNA primase
3. DNA helicase
4. DNA polymerase
5. Daughter DNA
6. Daughter DNA
7. DNA polymerase

Complete the Chart — Mitosis

1. Prophase
2. Metaphase
3. Anaphase
4. Telophase
5. Interphase

Worksheet 5

Words to Know: Define the Following:

1. **Organ:** a collection of various types of tissues that work together to perform a function
2. **Programmed cell death:** the process by which some cells are designed to self-destruct
3. **Anterior and posterior:** describe structures at the front (anterior) or the back (posterior) of the body
4. **Proximal and distal:** describe whether something is closer (proximal) or farther away (distal) from the middle of the body
5. **Superior and inferior:** describe whether something is above (superior) or below (inferior) something else

6. **Medial and lateral:** describe whether something is closer (medial) or farther away (lateral) from the midline, or center line, of the body
7. **Homeostasis:** the body has many mechanisms to help maintain a balance or “equilibrium” among its many systems
8. **Irreducible complexity:** many of the body’s systems cannot work unless others are already in place and working properly

Fill in the Blank

1. systems
2. circulatory
3. D
4. anatomical
5. anterior
6. internal
7. cells
8. homeostasis

Complete the Chart — Body Systems and Organs Included

Skeletal System: Bones and joints

Muscular System: Muscles

Cardiovascular System: Heart and blood vessels

Respiratory System: Upper airway (nose, pharynx, larynx), trachea, and lungs

Nervous System: Brain, spinal cord, and nerves

Digestive System: Mouth, esophagus, stomach, intestines, liver, gall bladder, and pancreas

Urinary System: Kidneys, ureters, and bladder

Reproductive System: (Male) Testes, genital ducts, and prostate; (Female) Ovaries, uterus, fallopian tubes, and breasts

Integumentary System: Skin, nails, and hair

Endocrine System: Pituitary gland, hypothalamus, thyroid gland, parathyroid glands, pancreas, adrenal glands, testes (male), and ovaries (female)

Lymphatic System: Lymph nodes, lymph vessels, thymus, tonsils, and spleen

Complete the Chart — Anatomical Position

1. Lateral