Terms To Know

**Anatomical Terminology**

- **Anterior** – front of the animal
- **Caudal** – towards the tail of an animal
- **Cranial** – towards the head of an animal
- **Deep** – further from the surface
- **Distal** – part of the limb furthest from the body
- **Dorsal** – along the back or uppermost surface
- **Frontal plane** – body plane that divides the animal into dorsal and ventral parts
- **Lateral** – side of an animal
- **Median** – body plane that divides the animal into “equal” right and left halves
- **Posterior** – rear of the animal
- **Proximal** – part of the limb closest to the body
- **Sagittal** – any body plane that is parallel to the median plane
- **Superficial** – closer to the surface
- **Transverse** – body plane that divides the body into cranial and caudal parts
- **Ventral** – along the belly surface

**Skeletal System**

- **Appendicular skeleton** – consists of fore and hind limbs
- **Axial skeleton** – consists of the skull and vertebrae
- **Comminuted fracture** – bone shatters into many pieces
- **Compound fracture** – bone breaks through the skin
- **Diaphysis** – body of a long bone
- **Endosteum** – thin inner layer of bone covering; lines medullary cavity
- **Epiphysis** – enlarged ends of long bones
- **Fissure fracture** – break along the long axis of a bone
- **Flat bone** – plate of bone, i.e. scapula
- **Greenstick fracture** – break on one side of a bone, usually due to a bending force
- **Irregular bone** – complex and irregularly shaped bone, i.e. vertebrae
- **Long bone** – bone longer than it is wide, i.e. humerus, radius, and femur
- **Medullary cavity** – space within the bone filled with marrow
- **Metaphysis** – joining point of epiphysis and diaphysis
- **Ossification** – process by which tissue and cartilage becomes bone
- **Periosteum** – thin outer layer of bone covering
- **Sesamoid** – small, seed-shaped bone embedded in a tendon, i.e. proximal and distal sesamoids
- **Short bone** – cube shaped bone, i.e. bones of the carpus and tarsus
- **Simple fracture** – bone does not break through the skin
- **Synovial joint** – freely moveable joint
- **Transverse fracture** – break completely across the bone
Directional Terminology

**Directions:** Label the drawing with the directional terms.

<table>
<thead>
<tr>
<th>Cranial</th>
<th>Caudal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximal</td>
<td>Distal</td>
</tr>
<tr>
<td>Dorsal</td>
<td>Ventral</td>
</tr>
<tr>
<td>Anterior</td>
<td>Posterior</td>
</tr>
</tbody>
</table>
Handout 1: Directional Terminology
3-D and Surface Planes

Directions: Label the drawing with the 3-dimensional and surface planes. Use colored pencil to shade each plane.

Frontal
Median
Superficial

Transverse
Sagittal
Deep
Handout 2: 3-D and Surface Planes

- Median
- Sagittal
- Transverse
- Frontal
- Deep
- Superficial
Anatomy & Physiology

General Tips:
- Safety should come first when working with live animals. Students working with horses, pigs, or cows for activity three should wear pants and boots.

Activity 1: Directional Terminology
Estimated Time: 30 minutes
- Students should use colored pens or pencils.

Activity 2: Gummi Bear Dissection
Estimated Time: 40 minutes
- Purchase enough gummies so that every student has ten.

Activity 3: Chalk Figures and Post Its
Estimated Time: 40 minutes
- Use very gentle animals with short hair.
- Remind students to palpate bones and joints carefully. Don’t poke and prod.

Activity 4: Pin the Tail on the Dog
Estimated Time: 40 minutes
- Choose a team leader for each team to keep track of the team’s cards.
- Cards can be enlarged and laminated for continued use.

Activity 5: Muscle Types Observation
Estimated Time: 40 minutes
- Purchase slides of muscle types from Carolina Biological or Wards.
Purpose:
Professionals who work with animals in a medical setting must know directional terms so that discussing and treating injuries, illnesses, and medical procedures can be precise. When directional terms are not used or are used improperly, costly mistakes can be made.

Objectives:
The students will be able to identify and use the most common directional terms and label any animal with those terms.

Materials:
Directional terminology handout
3D and surface planes handout
Colored pens or pencils

Procedure:
For each animal below, use a colored pen or pencil and label the animal with the correct directional term(s).

1. Divide these animals with a frontal plane.
2. Label the **dorsal** and **ventral regions** of these animals.

3. Divide these animals into a **median** and a **sagittal plane**.

4. Label these animals as being a **lateral**, **posterior**, or **anterior view**.
5. Label the **cranial** and **caudal regions** on these animals.

6. Divide these animals with a **transverse plane**.

7. Label **proximal** and **distal** on the horse’s legs and the parrot’s tail.
Activity 1: Directional Terminology

1. Frontal plane

2. Dorsal and ventral regions

3. Median and sagittal planes

4. Lateral, posterior, anterior

5. Cranial and caudal regions

6. Transverse plane

7. Proximal and distal
Name __________________________

**Purpose:**
To practice using directional terminology.

**Objectives:**
The students will be able to apply directional terminology by dissecting a three-dimensional object.

**Materials:**
10 Gummi bears per student
Plastic knives
Napkins
Tape

**Procedure:**
Divide each Gummi using the knife, tape it into the circle and label it:

1. **Dorsal & ventral surfaces**
   
2. **Anterior and posterior views**
   
3. **Cranial & caudal portions**
4. Place Gummi on its legs, like a four-legged animal stands.
   Cut one of the legs into **proximal** and **distal** portions. Eat the leftovers!

5. Place Gummi on its legs, like a four-legged animal stands.
   Cut along the **transverse plane** to divide into cranial and caudal parts.

6. Place Gummi on its side, like a four-legged animal lying down.
   Cut along the **frontal plane** to divide into dorsal and ventral parts.

7. Place Gummi on its legs, like a four-legged animal stands, and place it in an anterior view facing you. Cut it along the **median plane** to break into equal, symmetrical right and left halves.

8. Place Gummi on its legs, like a four-legged animal stands, and place it in an anterior view facing you. Cut along any **sagittal plane** except the median plane to divide it into unequal right and left halves.

9. Repeat and label your favorite “dissection” with any remaining Gummi bears!
Activity 2: Gummi Bear Dissection

1. Dorsal and ventral

2. Anterior and posterior

3. Cranial and caudal

4. Proximal and distal

5. Transverse plane

6. Frontal plane

7. Median plane

8. Sagittal plane

9. May be any of the above.
Quiz 1: Anatomical Terminology

Name: _____________________________

Directions: Label the drawings with the directional terms and planes on the right.

Cranial
Caudal
Proximal
Distal
Dorsal
Ventral
Transverse plane
Median plane
Sagittal plane
Frontal plane
Quiz 1: Anatomical Terminology
Unit C Evaluation

Anatomy & Physiology

Name __________________________

35 Questions

**Directions:** Use this word bank fill in the term that corresponds with the number on the drawings. Some words will not be used.

Scapula  Dendrite  Cranial  Trachea  Axon
Fibula    Dorsal   Humerus  Cerebellum  Soma
Skull     Gluteals Bronchi  Myelin  Lumbar vertebrae
Ulna      Meninges Masseter Tibia  Coccygeal vertebrae
Epiglottis Alveoli  Caudal Scapula  External abdominal oblique
Femur     Ventral  Proximal Bronchi  Cerebrum
Medulla   Metacarpals Semitendinosus Pectoral  Thoracic vertebrae

![Diagram of a horse with labeled parts]

1. __________________
2. __________________
3. __________________
4. __________________
Short Answer

Directions: Answer each question completely.

27. List the three types of muscles.

28. Explain the difference between voluntary and involuntary muscles.

29. What is the function of the respiratory system?

30. What is the function of the nervous system?

31. What are the parts of the central nervous system?

32. What is the peripheral nervous system?

33. Explain the function of skeletal muscle.

34. Name two bones or groups of bones that are part of the axial skeleton.

35. Name one place in the body that is lined with smooth muscle.

Bonus: What are the names of the first two cervical vertebrae?
Unit C Evaluation: Anatomy & Physiology

1. Caudal
2. Dorsal
3. Ventral
4. Cranial
5. Dendrite
6. Axon
7. Myelin
8. Thoracic vertebrae
9. Femur
10. Ulna
11. Skull
12. Metacarpals
13. Scapula
14. Coccygeal vertebrae
15. Fibula
16. Epiglottis
17. Alveoli
18. Trachea
19. Bronchi
20. Semitendinosus
21. Masseter
22. External abdominal oblique
23. Cerebellum
24. Cerebrum
25. Meninges
26. Medulla

Short Answer:
27. Skeletal, smooth, cardiac
28. Voluntary muscles require a conscious effort to move them. Involuntary muscles move without any thought.
29. To exchange oxygen and carbon dioxide within the body.
30. It detects and processes information and formulates a response.
31. The central nervous system consists of the brain and spinal cord.
32. The peripheral nervous system consists of the nerves that relay information to the spinal cord.
33. Skeletal muscle moves bones and supports the body structure.
34. Answer may be any two of the following: skull, ribs, sternum, cervical vertebrae, thoracic vertebrae, lumbar vertebrae, sacral vertebrae, or coccygeal vertebrae.
35. Answer may be any of the following: stomach, intestines, bladder, esophagus, or uterus.

Bonus: Atlas and axis
Unit C Evaluation: Anatomy & Physiology

1. Caudal
2. Dorsal
3. Ventral
4. Cranial
5. Dendrite
6. Axon
7. Myelin
8. Thoracic vertebrae
9. Femur
10. Ulna
11. Skull
12. Metacarpals
13. Scapula
14. Coccygeal vertebrae
15. Fibula
16. Epiglottis
17. Alveoli
18. Trachea
19. Bronchi
20. Semitendinous
21. Masseter
22. External abdominal oblique
23. Cerebellum
24. Cerebrum
25. Meninges
26. Medulla

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