

Healthy Active Living Education (Exercise Science)

Date: May 4th, 2015

Update On Course Breakdown

Gym Time (25%)

I take attendance :)

-**Total Mark** is out of 24
(3 times per week)

X

8 weeks = 23 (because of trip)

-**Day Mark:** 0.7/1=attendance

+

0.2= Participation

+

0.1= Technique Mastery

=

1.0

Final Exam (25%)

(1/2 Exercise Science and 1/2
Food/Nutrition)

-Multiple Choice

-Short Answer

-Matching

-Labelling Diagram(s)

Note: Final Exam material has yet to
be determined!

You will only be responsible for what I
put on my slides.

Course Schedule

- **Week 1 – 3: (April 27th - May 18th):**
Anatomy and Physiology
- **Weeks 4 – 6: (May 25th – June 1st):**
Exercises, physical testing and program creation
- **Weeks 7-8 (June 8th – June 15th):**
History of Sport and Recreation

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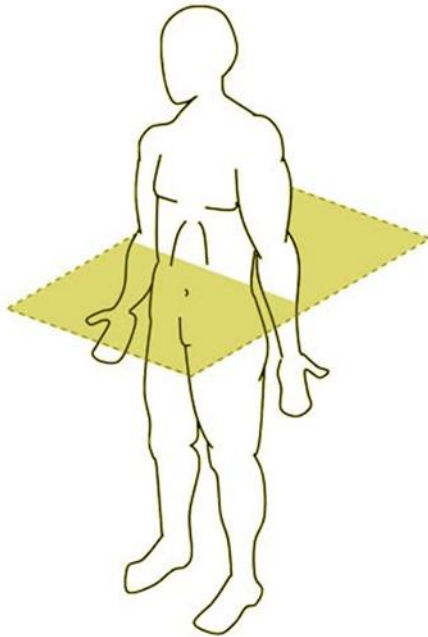
Intro to Movement

- In order for you to understand bones and muscles, you have to understand planes of movement as well as the orientation of physical structures.
- Before you learn the exercises that work specific muscles, you have to know the muscles first and the types of movement they create.

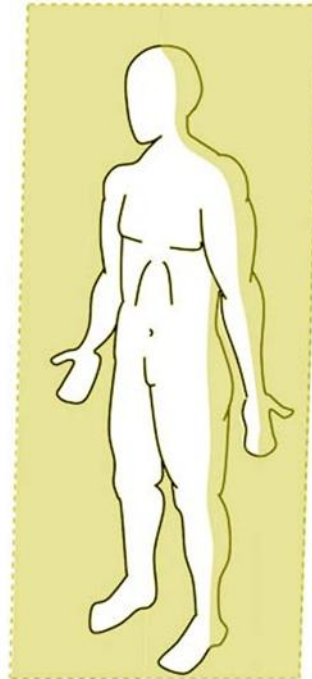


Planes of Movement

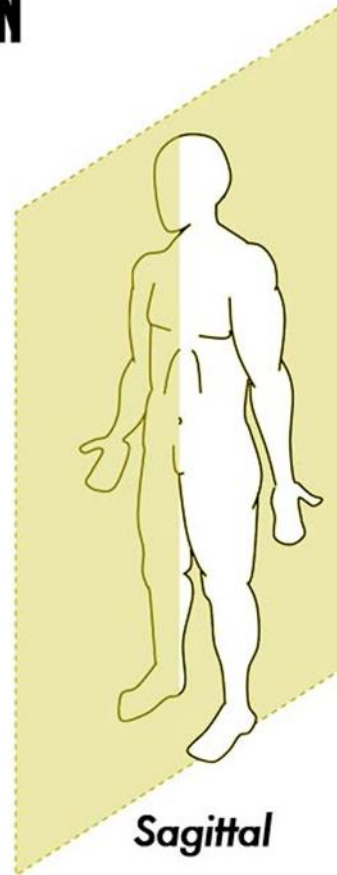
THREE PLANES OF MOTION



Transverse



Frontal



Sagittal

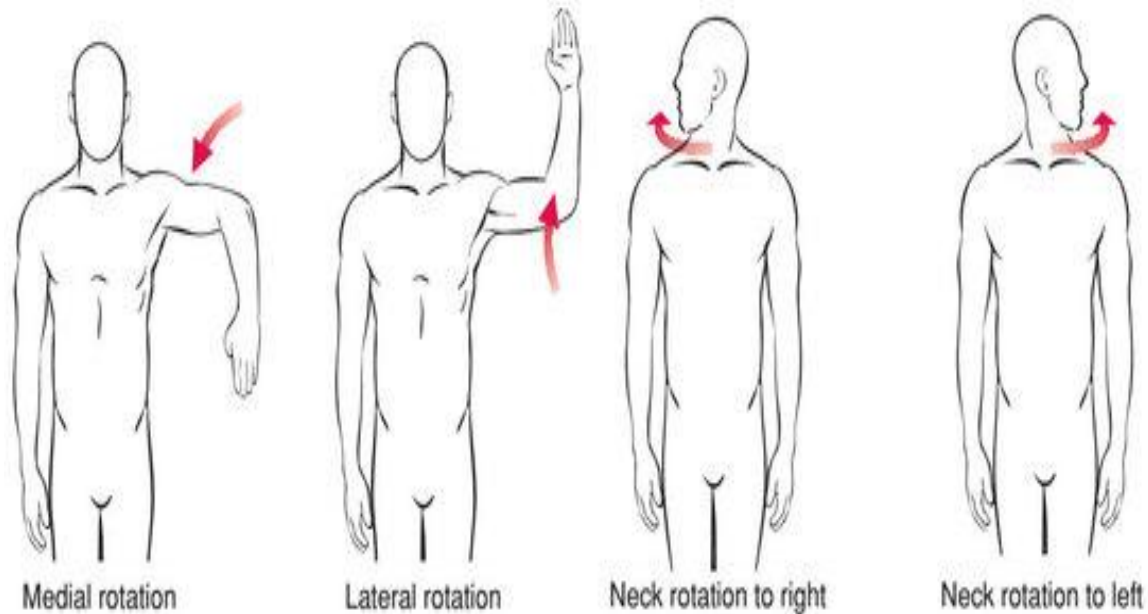
Planes of Movement

- **Transverse plane:** Rotation
- **Sagittal plane:** Flexion/Extension
- **Frontal/Coronal Plane:**
Abduction/Adduction

Planes of Movement

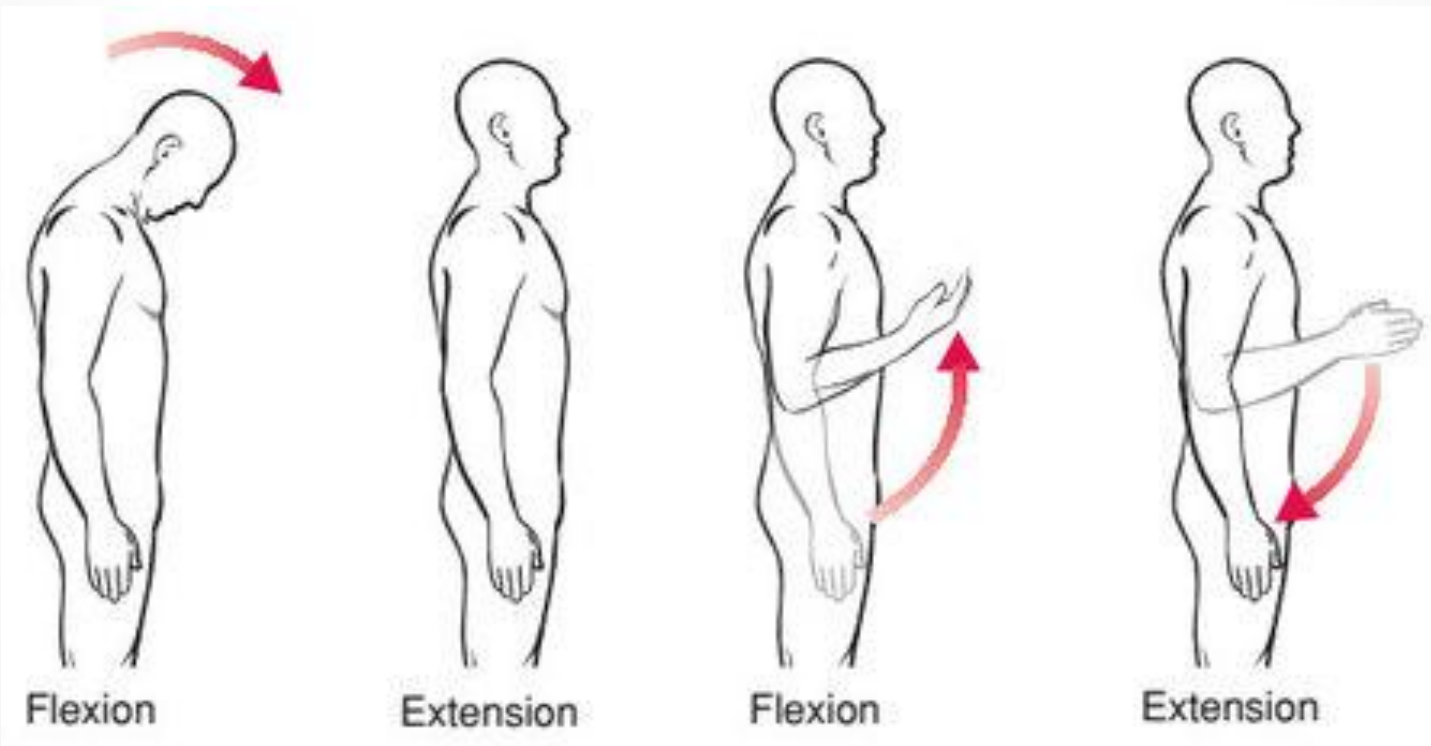
Examples of movements in each plane

**Transverse
Plane:**



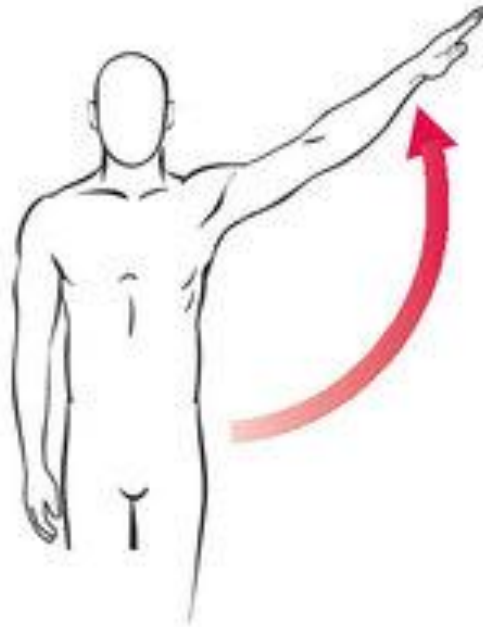
Planes of Movement

Sagittal Plane:

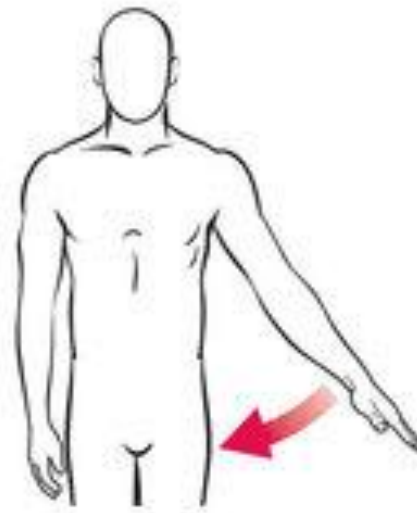


Planes of Movement

Coronal/Frontal Plane:



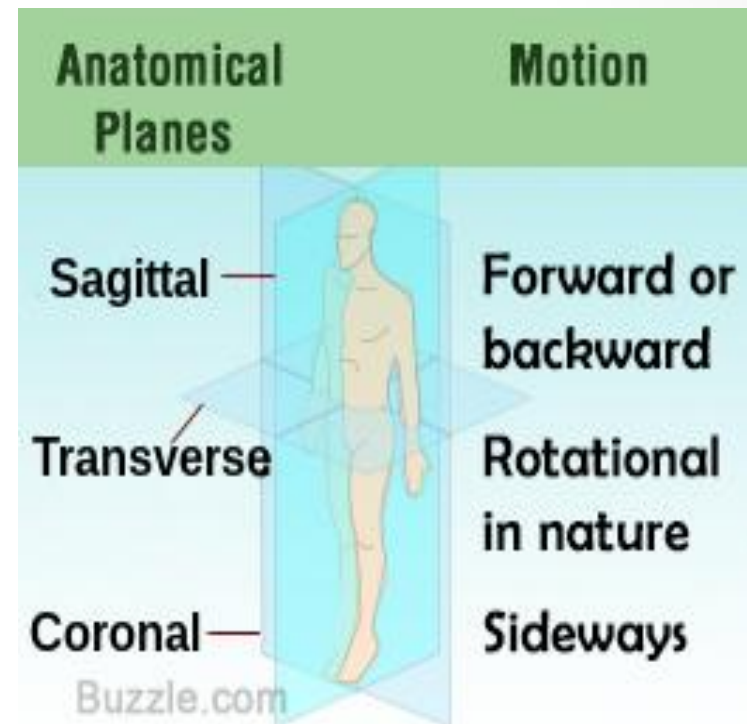
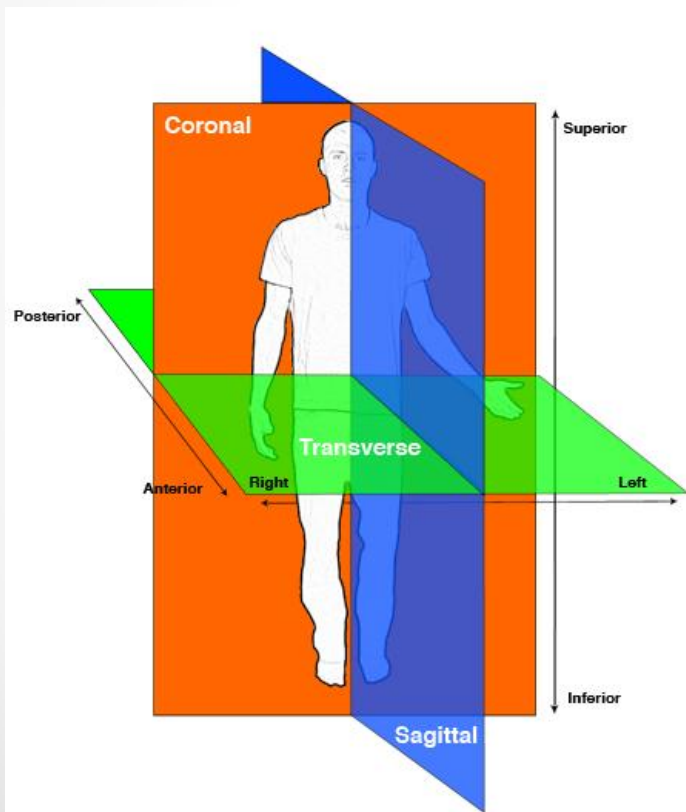
Shoulder abduction



Shoulder adduction

Demonstrating planes

- <https://www.youtube.com/watch?v=I21jngmeiFM>

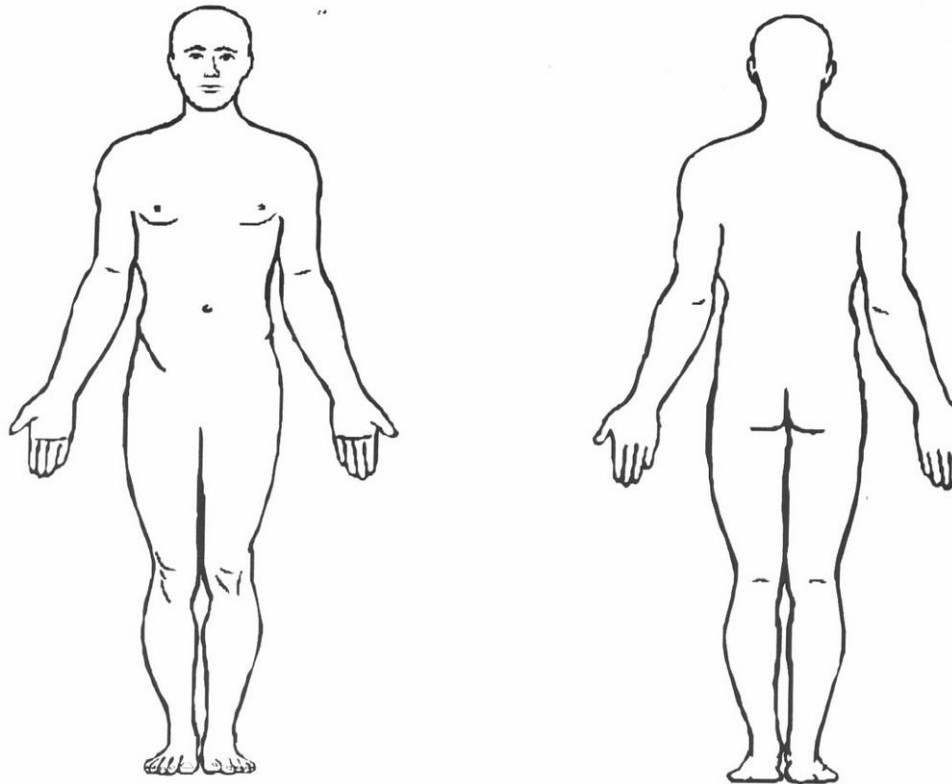


Anatomical Locations

- Now we need to know the point of reference from the places that we look at the human body.
- We are now focusing on location and direction only, not planes of movement.

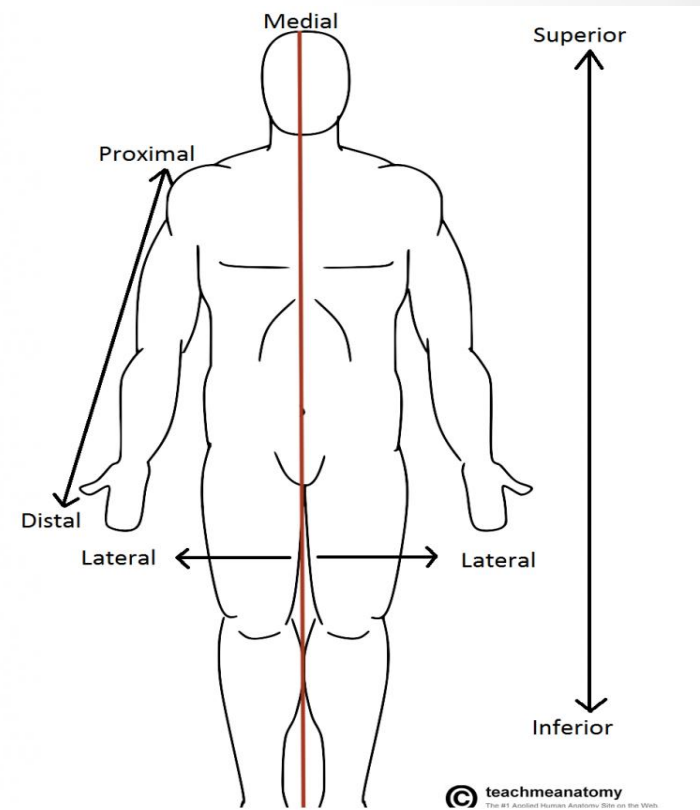
Anatomical Locations

The Anatomical Position



Anatomical Locations

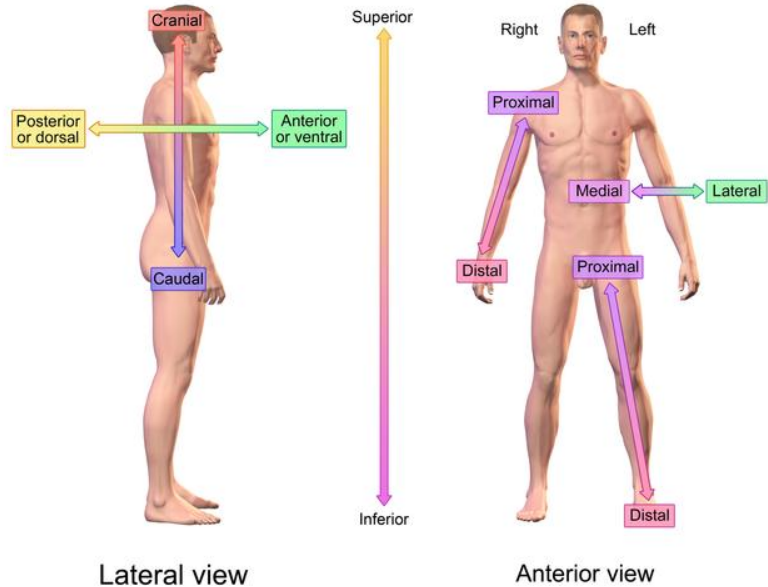
- The anatomical position is the main reference point we use when referring to the human body.
- **Note:** Do not worry about proximal/distal. It will not be tested.



Anatomical Locations

- What you need to know:

- 1) Anterior/Posterior
- 2) Superior/Inferior
- 3) Medial/lateral

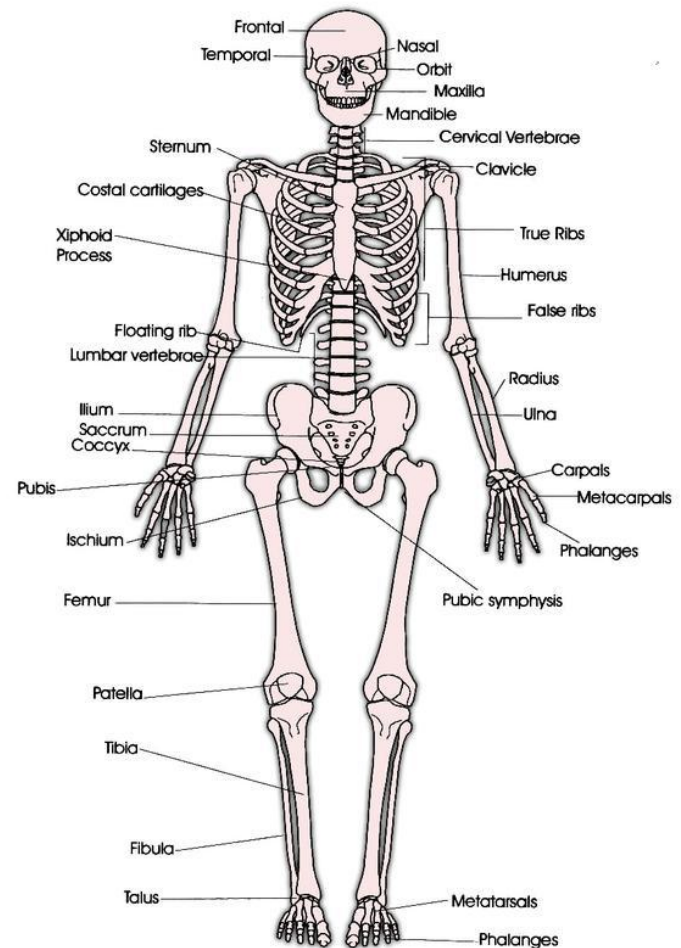


Directional References

The Skeletal System

- Primary Functions

- 1) Support and protect Major organs
- 2) Calcium Storage
- 3) Provide structural framework to elicit movement for muscles
- 4) Blood Cell Production



Two Types of Skeleton

Organization of the Skeleton

Axial Skeleton



Axial Skeleton is the “**blue**”

Appendicular Skeleton



Appendicular Skeleton is the “**purple**”

Why are there two types of skeletons?

Hint: Think of their location and how they
contribute to joint movement

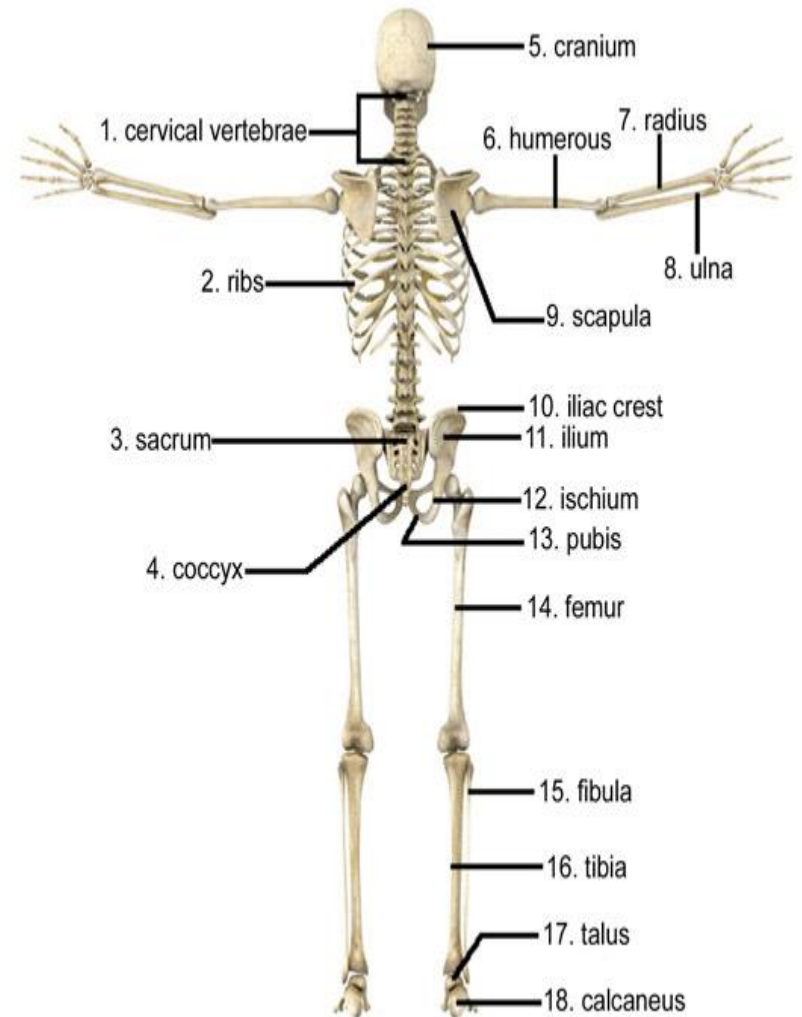
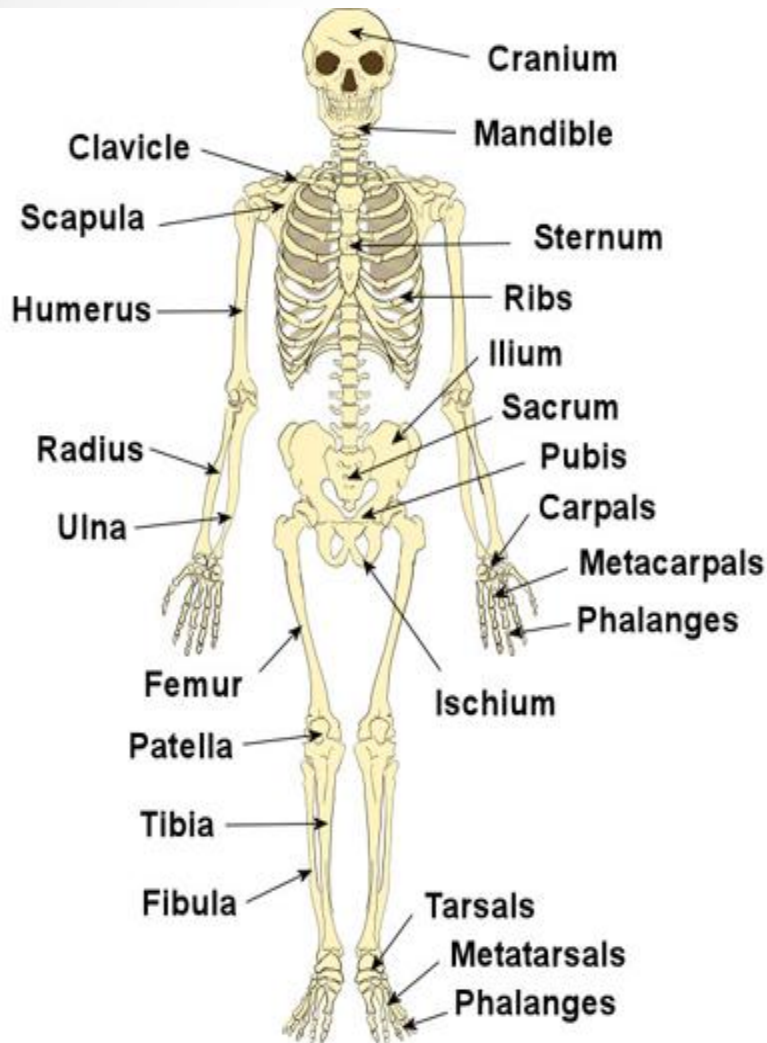
Answer

- The Axial skeleton does not contribute to joint movement.
- The spine and its associated vertebrae have very little movement if none at all.
- The appendicular skeleton has appendages like the arms, legs, hands, feet etc.

ANSWER...

- The ball and socket joint (i.e. the hip joint and the shoulder joint) contribute to the greatest range of motion and/or movement.
- The joint with the most limited movement are the ones involves in sliding (i.e. apophyseal joints)

Bone Anatomy Basics



Need to know Bones

Radius/Ulna

Tibia/Fibula

Humerus

Femur

Scapula

Clavicle

Need to know Bones

Sternum

Tarsals/Meta-Tarsals

Carpals/Meta Carpals

Phalanges (Both fingers and toes)

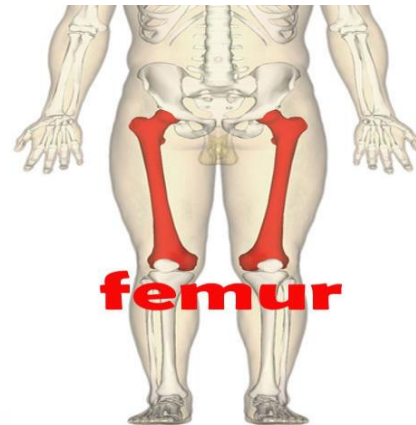
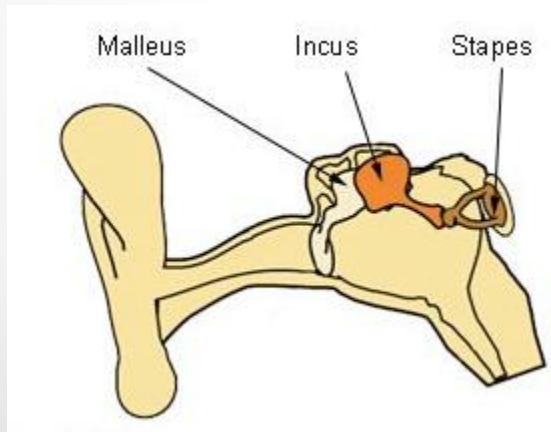
Why?

- You will be required to label a skeleton on the final exam.
- You will need to know which bones are the longest and which are the smallest
- You will also need to differentiate between the bones of the upper body and lower body



The Skeletal System

- There are a total of 206 bones in the body
- The longest/largest bone in the body is the femur
- The smallest bone is the stirrup bone located behind the ear.



Anatomy of the Bone

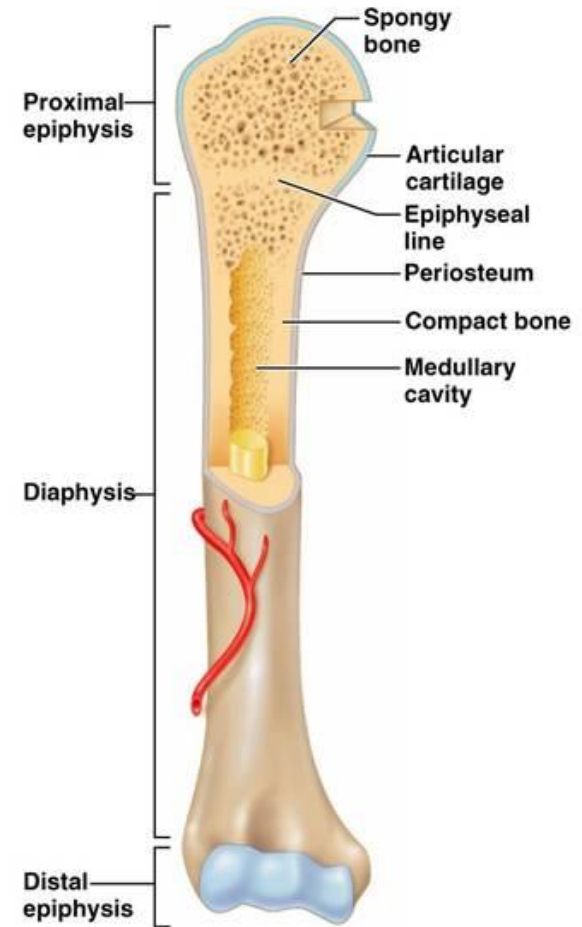
- Four main components

1) Proximal Epiphysis

2) Diaphysis: The shaft of the Bone.

3) Distal epiphysis

4) Periosteum



(a)

Bone Development

- In early childhood, cartilage forms before the thick and hard bone, thus allowing infants to have increased flexibility.
- Bone development occurs throughout adulthood as well but not for growth, more so for remodeling and repair.
- Osteoclasts are cells that breakdown bone. Osteoblasts are cells that build bone.

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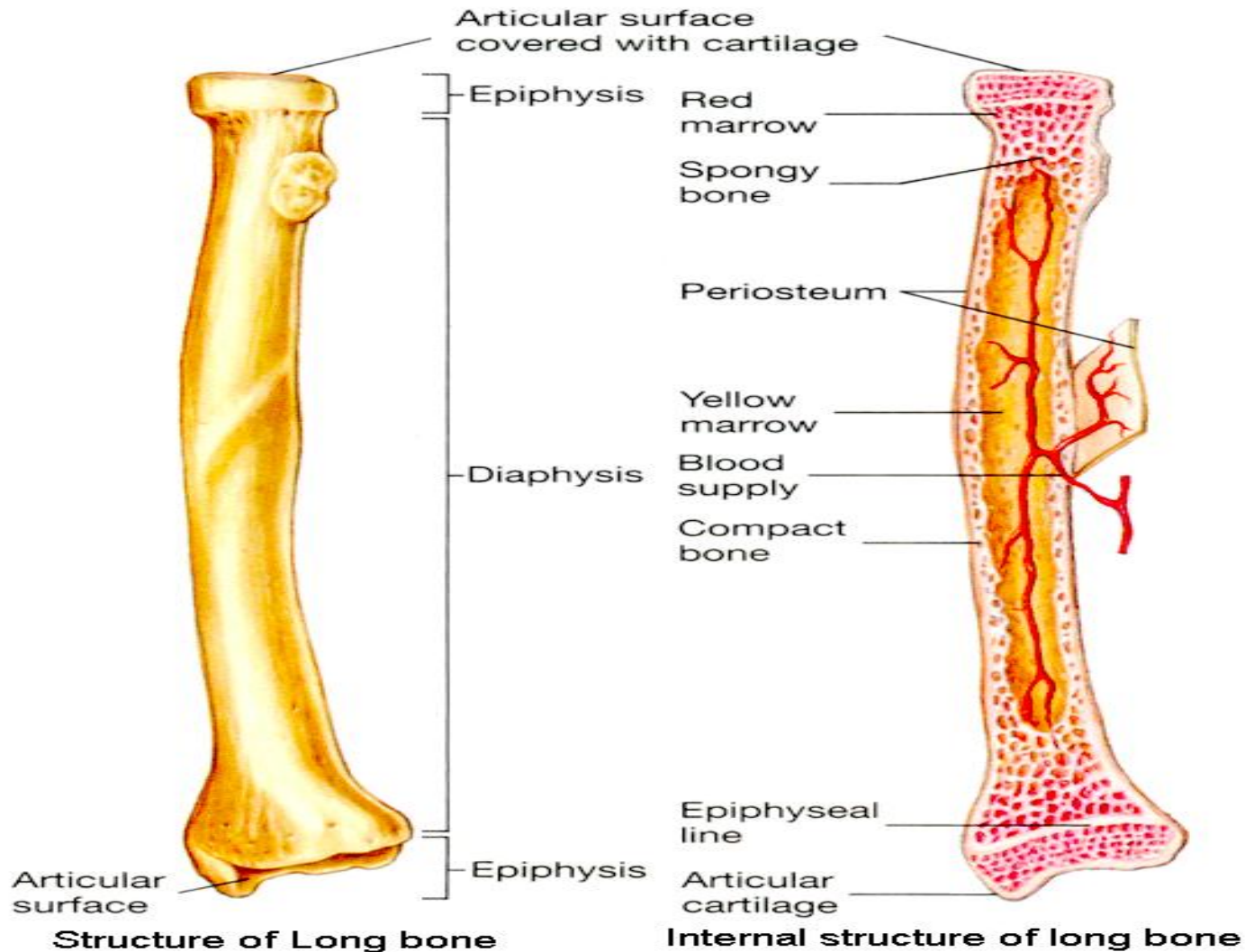
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Bone Marrow

- Recall that one of the functions of the skeletal system is to produce red blood cells.
- Inside the center of bones is the bone marrow. It houses nutrients and the building blocks to make red blood cells.
- Red Marrow is specific for red blood cell development. Yellow Marrow is for fat and cartilage development.

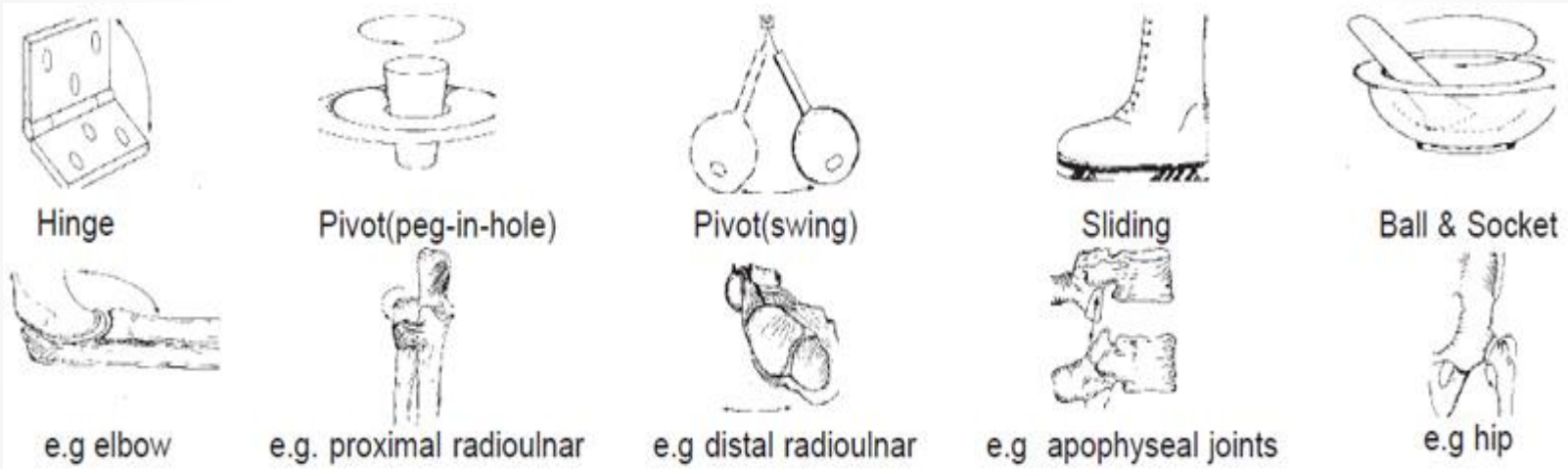


Bone Marrow



Joint Types

There are five major joint types.



Which one do you think gives you the most range of motion?