

1. What are the functions of Bone? List and Explain

Structure: Bones act as a scaffolding for the body. It is what things are built off of

Protection: Protect vital organs (EX: Ribs protect lungs/heart)

Leverage: As bone and muscle come together it allows movement

Storage: Bones are composed of lots of different minerals; Sometimes bone breaks down to release these minerals for the body to use

2. What are the two types of bone?

Spongy & Compact

3. What are the 4 major bone cells? What are each of their jobs?

Osteoprogenitor Cell: Precursor to osteoblast or osteocyte; The step after mesenchymal germ cells; The cell has been assigned an area but not a specific job

Osteoblast: Bone building cell

Osteoclast: Opposite of osteoblast; Breaks down bone tissue into its components

Osteocyte: Mature bone cell; Derived from osteoblast

4. Spongy bone is also called _____. What is the major function of Spongy bone?

Where is spongy bone found?

- Cancellous Bone
- Function: Helps reduce the weight of bones and keep the skeleton light while preventing it from being damaged by forces
- Usually found in the Epiphysis

5. What are the major characteristics of Compact bone? Where do we find Compact bone?

- Heavy, Dense, Strong
- Makes up the shaft of long bones and the outside of all bones

6. There is a major component of Compact bone, what is it? Why is it important?

- Compact bone contains the Haversian Canals
 - o These canals house the following:
 - Nerves that allow bones to reply to nerve stimulus
 - Blood Vessels that allow bone to repair itself
 - Lymph Vessels that make connection to the lymphatic system

7. Where is bone marrow found? What are the two types? Describe each.

Found in the spaces between spongy bone

- Red Bone Marrow:
 - o Forms Blood Cells
- White Bone Marrow
 - o Does not produce blood cells
 - o Made primarily of fat
 - o Can return to red bone marrow if needed by body (EX: severe blood loss)
 - o Fat storage

8. What are the two types of osseous cartilage? Describe each.

- Articular Cartilage:
 - o Protective
 - o Maintains integrity and function of bone
 - o Can degrade over time
- Epiphyseal Cartilage:
 - o Growth Plates
 - o Site of long bone lengthening during growth
 - o Located between Epiphysis and Diaphysis

9. What are the two phases of bone growth and development? Describe each.

- Ossification:
 - o Osteoblasts produce matrix
- Calcification:
 - o Calcium and Phosphorus harden matrix and make crystals

10. One of the phases from Q9 can be broken down further. What are the subsections? Describe each.

Ossification:

- Heteroplastic: Calcification of tissue other than bone; Not true bone tissue creation but parts of body is calcified; Located in heart and male repro tract
- Intramembranous: Bone from fibrous membrane; Formation of bone within a bone that is already existing; Creation of flat bones; Ossification produced by osteoblasts
- Endochondral: Bone development from replacing hyaline Cartilage; Important during hardening of fetal bones.

11. What hormones regulate bone growth?

Growth Hormone (GH)

Gonads – ovaries and testes (sex hormones: E2 and Testosterone). Testosterone stimulates GH. This is why we see a big frame difference between geldings and stallions or steers and bulls.