**Bone and Skeletal Tissue Guided Notes**

**3 Types of Cartilage:**

1. Hyaline

-Function- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and flexibility. It makes up \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage, laryngeal cartilage, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage (windpipe), nasal cartilage, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plates.

2. Elastic

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bending. Makes up external \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Fibrocartilage

-highly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It makes up the \_\_\_\_\_\_\_\_\_\_\_\_ between the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, meniscus of the \_\_\_\_\_\_\_\_\_\_\_\_, and the pelvic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Five Functions of Bone**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Protection

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ storage

5. Blood cell formation= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Hematopoesis**

-Infants have \_\_\_\_\_\_ marrow in the medullary \_\_\_\_\_\_\_\_\_\_\_\_\_\_

-Adults have red marrow in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_ marrow in the medullary cavity

**Parts of a Bone**

Periosteum

- A \_\_\_\_\_\_\_ layer membrane around the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-contains \_\_\_\_\_\_\_\_\_\_\_\_ and blood \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ periosteum is \_\_\_\_\_\_\_\_\_\_\_\_-provides protection

-The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ periosteum is made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells:

 -Osteoblasts- bone (bone builders)

 -Osteoclasts- bone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Endosteum

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lining of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavity. It also lines \_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in bones

**Types of Bone**

Compact vs. Spongy

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone-made of long \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ called osteons

-Supplied with \_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ canals-up and down. They are linked by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ canals-across

Structure of Bone: Spongy Bone

-Spongy bone- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ resist \_\_\_\_\_\_\_\_\_\_\_\_ in adults, it contains marrow (produces \_\_\_\_\_\_\_\_\_\_\_\_)

Long Bones

-Longer than they are \_\_\_\_\_\_\_\_\_\_\_

-Diaphysis-\_\_\_\_\_\_\_\_\_\_\_\_; surrounds the medullary \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Mostly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone

-Epiphysis-\_\_\_\_\_\_\_\_\_\_\_; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone inside, compact bone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-Joint surface= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage

-Epiphyseal line= growth \_\_\_\_\_\_\_\_\_\_\_\_\_

Short Bones

-roughly \_\_\_\_\_\_\_\_\_\_ like. Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_, ankle, sesamoid

-Mostly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone, \_\_\_\_\_\_\_\_ compact cover

Flat Bones

-Flat, \_\_\_\_\_\_\_\_\_, curved. Examples- \_\_\_\_\_\_\_\_\_, skull

-Parallel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone surface, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone inside

Irregular Bones

-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shapes. Examples- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, hip

-Mostly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone that’s enclosed by \_\_\_\_\_\_\_\_\_\_ compact bone

Bones are Made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_ components

-Organic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and osteoclasts (cells)

 -\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, collagen fibers

-Inorganic: hydroxyapatites, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ salts

**Calcium**

-Necessary for:

 -nerve \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, muscle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, blood coagulation, secretion of glands, cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_

How Calcium’s Obtained

-Calcium is obtained in your \_\_\_\_\_\_\_\_\_\_ and absorbed in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ under the control of vitamin \_\_\_\_\_\_\_

-Diet should contain: proteins, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ C, vitamin A, vitamin \_\_\_\_\_\_\_\_, calcium, phosphorus, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and manganese for bone health. Vitamin D is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_

High Calcium Levels

-Change in plasma calcium homeostasis

 -Detected by the \_\_\_\_\_\_\_\_\_\_\_\_\_ gland 🡪 secretes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Affects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in bone tissue 🡪 osteoblasts \_\_\_\_\_\_\_\_\_\_\_ bone by depositing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 removes calcium from plasma (blood) 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plasma calcium levels

Low Calcium Levels

A change in plasma calcium homeostasis

 -Detected by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gland 🡪 secretes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hormone (PTH) 🡪 affects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in bone tissue 🡪 osteoclasts \_\_\_\_\_\_\_\_\_\_\_\_\_ down bone by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ calcium 🡪 deposits the calcium in the \_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plasma calcium levels

Low vs. High Calicum Levels

-Calcium is absorbed from the \_\_\_\_\_\_\_\_\_\_ intestine under the control of vitamin \_\_\_\_\_

-Low calcium causes \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of many body systems

-High calcium causes \_\_\_\_\_\_\_ deposits in the \_\_\_\_\_\_\_\_\_\_\_\_\_ and blood vessels

**Osteogenesis: \_\_\_\_\_\_\_\_\_\_ Creation**

-Bone is always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, growing, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and repairing

-\_\_\_\_\_\_\_\_\_\_\_ Law- a bone will \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in response to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or forces placed upon it. Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ dancer, weight lifter

Steps in Ossification

1. Starts as \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage

2. Bone replaces cartilage at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Bone replaces cartilage at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Bone replaces cartilage at \_\_\_\_\_\_\_\_

5. Only cartilage remaining is at the ends (\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage) and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate (growth plate)

**Fractures**

1. Simple- clean \_\_\_\_\_\_\_\_\_\_\_\_ break

2. Compound- broken ends, \_\_\_\_\_\_\_\_\_\_\_\_ through skin

3. Comminuted- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (aged)

4. Compression- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Depressed- pressed \_\_\_\_\_\_\_\_\_\_\_\_\_ (skull)

6. Impacted-ends \_\_\_\_\_\_\_\_\_\_ into each other (result of a \_\_\_\_\_\_)

7. Spiral- \_\_\_\_\_\_\_\_\_\_\_\_, twisted (sports, trauma)

8. Greenstick- break is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (common in children)

Steps in Repair

1. Hematoma \_\_\_\_\_\_\_\_\_

2. Fibrocartilaginous \_\_\_\_\_\_\_\_\_\_ formation- \_\_\_\_\_\_\_\_\_\_\_ the broken bone

3. \_\_\_\_\_\_\_\_\_ (hard) callus

4. Remodeling-excess bone is broken down by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Problems**

-Osteoporosis-bone \_\_\_\_\_\_\_ due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes that interfere with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ deposits in bone. It leads to \_\_\_\_\_\_\_\_\_\_\_ problems and fractures-occurs at/after \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-Rickets-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ disorder caused by the \_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and vitamin D in the diet. The bones are \_\_\_\_\_\_\_\_ and do not support the weight, so they \_\_\_\_\_\_\_\_ (bowed legs)

-Paget’s Disease- caused by the \_\_\_\_\_\_\_\_\_\_\_\_ deposits of \_\_\_\_\_\_\_\_\_\_\_\_\_

-Spina Bifida- birth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Bones of the \_\_\_\_\_\_\_\_\_\_\_ (vertebrae) don’t form \_\_\_\_\_\_\_\_\_\_\_\_\_ around the \_\_\_\_\_\_\_\_\_\_\_ cord, so the cord \_\_\_\_\_\_\_\_\_ out. It can be mild or severe