**Ch 6 Skeletal System:**

**Cartilage, Bone Classification, Gross Anatomy, and Microscopic Anatomy**

**Cartilage**

The human skeleton initially consists of just cartilage. It is replaced by bone in all areas except those requiring \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Cartilage is made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cells) which lie in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (small spaces “lagoons”) within a jelly-like matrix.

|  |  |  |
| --- | --- | --- |
| Type of Cartilage | Type of Fibers | Location in Body |
|  |  |  |
|  |  |  |
|  |  |  |

Cartilage grows by adding new matrix on the surface of cartilage (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ growth) or by making new matrix within cartilage (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ growth).

**Bones**

There are 7 functions of bones:

1. 5.

2. 6.

3. 7.

4.

Your skeleton has \_\_\_\_\_\_\_ bones,

2 divisions of the skeleton are:

a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ includes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ includes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Bones are classified according to their shape:

|  |  |  |
| --- | --- | --- |
| **Shape** | **Description** | **Examples** |
|  |  |  |
|  |  |  |
|  |  |  |

A bone is considered an organ because?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Bone is composed of a dense, smooth outer layer called \_\_\_\_\_\_\_\_\_\_\_\_ bone. It is sandwiched between connective tissue membranes, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the outside and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ covering the inside. Within the bone are areas made of honeycombs of small needle-like pieces of bone called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bone (or It is in this area that bone marrow is scattered. The area of bone that is part of a movable joint is coveA red in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cartilage.

**Structure of a Long Bone**

Long bones have a shaft (called the \_\_\_\_\_\_\_\_\_\_\_) , bone ends (called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_), a hollow center (called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavity), and membranes which cover the inside of the cavity (the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) as well as the outside of the bone (the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_). The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate is where bone growth occurs in children. As an adult, it becomes the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ line.

Sketch a long bone below and label these parts

|  |
| --- |
| Sketch: |

**Bone Membranes**

Bones have 2 membranes:

|  |  |  |
| --- | --- | --- |
| Membrane | Description | Found? |
|  |  |  |
|  |  |  |

**Bone Marrow**

Red marrow is hematopoietic which means it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In newborns, it is found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In adults, it is found \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The job of yellow marrow is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is found \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and can convert to red marrow if a person becomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Bone Markings**—also see the list from lab

**Microscopic Anatomy of Bone—Bone Cells**

|  |  |  |
| --- | --- | --- |
| **Type of Cell** | **Description** | **Found?** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Compact Bone (also called Lamellar Bone)**

Consists of:

1.

2.

3.

Osteon (Haversian System)—structural unit of compact bone

* Consists of long cylinders that run \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to long axis of bone; weight-bearing pillars
* Osteon cylinder is made of rings of bone matrix called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Canals and Canaliculi

* Central (Haversian) canal runs through the core of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Perforating (Volkmann’s) canals run at right angles to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Lined with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and connect blood vessels & nerves of periosteum, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavity, and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Small cavities that contain osteocytes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; “lagoons”
* Small “canals” that connect lacunae to each other and to central canal are\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
* They form when matrix hardens and traps cells; This allows \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between all osteocytes of osteon as well as permitting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to flow from one cell to another.

Lamellae

* Interstitial lamellae- NOT part of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ; “in between”
* Circumferential lamellae- found around “circumference” of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; helps bone resist twisting

**Spongy Bone (also called cancellous or trabecular bone)**

* Organized along lines of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Trabeculae are responsible for bone strength
* No \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ present, but do have irregularly arranged \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ interconnected by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Nutrients are supplied by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Bone Composition**

Bone is made of both organic and inorganic components:

1. Organic components- Include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Osteoid- makes up \_\_\_\_\_\_\_\_\_ of organic bone matrix; made of ground substance and

\_\_\_\_\_\_\_\_\_\_\_\_\_ fibers; makes bone flexible

2. Inorganic components-

Hydroxyapatites (mineral salts)- make up \_\_\_\_\_\_\_\_% of bone by mass; composed of

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ crystals; makes bone hard