Skeletal Guided Notes

The **skeletal system** provides form and support to the body. Without a skeleton you would not be able to walk, talk, or lift objects. There would be little protection to your brain and internal organs. In fact, without bones you would be a formless being. Bones (1) protect the _______ _______ inside the body, (2) provide anchor or support to the _______ and produce _______ cells.

There are two divisions of human skeleton. The _______ _______ includes the skull, vertebral column, ribs and _______. The _______ _______ includes bones of the _______, _______, legs, feet, shoulders and hips. The skeletal system includes the bones, cartilage, ligaments, and tendons. These are tissues that make up the skeleton.

A _______ is a hard, living tissue and contains blood vessels, nerves and dividing cells. Most bones are hollow, or at least spongy inside. The hollow center of the bone is the _______. The marrow produces red and white blood cells and stores some of the body’s excess fat.

_______ is a tough, flexible tissue. Cartilage is the one cushioning the ends of the long bones where they meet. You can feel the cartilage in your earlobes and the lower part of your nose. Cartilage is also found in the _______ of the voice box and in the _______.

_______ attach one bone to another where two bones connect. Ligaments are tough strands of _______ tissues. It is the ligaments that hurt when you sprain an ankle.

_______ are tissues that connect the bone to a muscle. Have you ever seen the thin, pink, tough membrane covering the outside of the bone? This is the _______, a tough, living membrane that covers all the bone except the ends. This is richly supplied with _______ _______. The periosteum is necessary for _______ the bone, for producing bone cell and for repairing injuries.

**A. Bone Structure**

Bone is a connective tissue. Bones are classified as _______, _______, _______ or _______. Arm and leg bones are _______ bones. Wrist bones are _______ bones. The skull is made up of _______ bones. The bones of the face and vertebrae are_______ bones.
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All bones have dense and outer layer of compact bone for strength and protection. _______ contain nerves and blood vessels. The blood vessels bring _______ and nutrients to living bone cells called osteocytes.

Less-dense _______ bone is found at the center of short and flat bones and at the ends of long bones. _______ bone is surrounded by compact bone and does not have osteons. Instead, it has cavities that contain _______ _______.

B. Bone Marrow

The two types of bone marrow are red and yellow. _______ bone marrow produces red and white blood cells and _______. Red bone marrow is found in _______, femur, sternum, ribs, _______, and _______. Children’s bones have _______ red bone marrow than adult bones. Yellow bone marrow in other bones contains _______ _______.

C. Bone formation and repair

The skeletons of embryos are made of _______. As the fetus develops, the cells in cartilage become bone-forming cells called _______. Bone forms from osteoblasts through _______. Except for body parts such as _______, ears, and _______ _______, the human skeleton is a bone. Osteoblasts are also responsible for bone growth and _______.

Bone are constantly being remodeled, which means old bone cells are replaced with new cells. Cells called osteoclasts _______ _______ bone cells, which are replaced with new cells. Nutrition and _______ are
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important for bone growth. When a bone breaks but does not come through skin, it is a _____ _______. When the bone breaks and does come through skin, it is a _____ _______. A _____ _______ is a thin crack in the bone.

When a bone is broken, _____ flood the area. They reduce the pain for a short time. The injured area swells and a _____ _______ forms at the break in the bone (see figure 3). New bone begins to form within _____ hours. First, _____ forms at the location of the fracture. This tissue is weak. In about _____ weeks, osteoblasts form a _____ bone around the fracture. Later, osteoblasts _____ the spongy bone while _____ create stronger compact bone to replace it. Splints and _____ help keep broken bones in place until new bone forms.

D. Joints

Two or more bones meet at a ______. Each joint allows a certain type of movement (see table 1) except the skull bones. _____ hold the bones together. It is a tough band of connective tissue that attach one bone to another.

Table 1: Types of Joints

<table>
<thead>
<tr>
<th>Joint Name</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ball-and-Socket</td>
<td></td>
<td>Hip joint, shoulder joint</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Joint Type</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hinge</td>
<td>Outward curve of one bone fits into inward curve of another bone; allows back and forth movement</td>
<td><img src="image1.png" alt="Hinge Joint Image" /></td>
</tr>
<tr>
<td>Gliding</td>
<td>Wrist joint, ankle joint and vertebra</td>
<td><img src="image2.png" alt="Gliding Joint Image" /></td>
</tr>
</tbody>
</table>

### Primary Movement
- **Rotation**: Such as twisting the lower arm at the elbow joint.

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<table>
<thead>
<tr>
<th>______</th>
<th>joints in the skull that are not movable</th>
<th>skull joint</th>
</tr>
</thead>
</table>

E. Common Problems in the Bones

a. Osteoporosis
   ______ in the diet is important to bone growth and repair. Too little calcium can lead to a condition called osteoporosis, which results in weak bones that break easily.

b. Osteoarthritis
   ______ covers the ends of bones in movable joints. The cartilage cushions the bones in the joint and allows ______. Osteoarthritis is a painful condition that affects joints and results when cartilage in the ______ deteriorates. ______ to a joint can result in osteoarthritis.

c. Rheumatoid arthritis
   Rheumatoid arthritis affects the joints but does not result from deteriorating ______. Affected joints are swollen and painful. The joints lose both ______ and ______.

d. Bursitis
   Fluid filled sacs called ______ surround shoulder and ______ joints. Bursae reduce friction and act as ______ between bones and tendons. Bursitis is an inflammation of the bursae, causing pain, swelling and reduction in movement.

e. Sprain
   A sprain is a damage to the ______ of a joint. Sprains result from ______ a joint and cause pain and ______.