

# Chapter Four

## Skeletal System



I find this humerus !

# Day One:

Today, your child should complete their reading and practice problems for the week.

Below are the supplies for this week's lab:

Three chicken leg bones (or smaller bones if possible)

Vinegar

Oven

Cookie sheet and foil

Small drinking glass

Small cooking pan

## National Science Education Standards covered this week:

12CLS1.6 Cells can differentiate, and complex multicellular organisms are formed as a highly organized arrangement of differentiated cells.

# Definitions

<b>appendicular skeleton</b>	the lower skeleton containing the pelvis and all of the extremities
<b>articulation</b>	joints; an area in the human body that holds two bones together
<b>axial skeleton</b>	bones which are responsible for protecting the head, neck, and trunk of the body
<b>cartilaginous joints</b>	joints which are made up of either hyaline cartilage or fibro-cartilage and provide little if any movement
<b>cervical (neck) curvature</b>	top section of the spinal cord which contains seven vertebrae within the neck
<b>coccyx</b>	tailbones; four fused vertebrae found within the pelvic curvature
<b>compact bone tissue</b>	hard outer layer of bones
<b>diaphysis</b>	long shaft of a long bone
<b>epiphyseal plates (growth plates)</b>	two cartilage plates found where the diaphysis meets the epiphyses on both of its ends; areas where new cells continue to grow thereby lengthening the long bones
<b>epiphysis</b>	enlarged rounded end of a long bone
<b>extremities</b>	arms and legs
<b>false ribs</b>	8th-10th pairs of ribs which are attached to the seventh pair of ribs
<b>fibrous joints</b>	joints which do not allow any movement to exist at all between the two bones
<b>flat bones</b>	flattened bones found in the skull and pelvis which typically protect softer tissues/organs
<b>floating ribs</b>	last two pairs of ribs which are unattached to any other structures
<b>hematopoiesis</b>	the process of blood formation
<b>hyaline</b>	form of connective tissue which is very smooth and allows tissues to move/slide over each easily

<b>irregular bones</b>	bones having many different shapes; examples include the jawbone and kneecap
<b>ligaments</b>	a type of connective tissue proper which connects bones to other bones
<b>long bones</b>	those which are typically found within the arms and legs
<b>lumbar curvature (small of the back)</b>	a section of the spinal cord which contains five vertebrae and carries most of the weight of the human body
<b>mandible</b>	jawbone
<b>ossification</b>	process of bone development
<b>osteoblasts</b>	the main bone-building cells during human development
<b>osteoclasts</b>	cells found within the center of a bone which secrete proteins that destroy bone tissue
<b>osteocytes</b>	mature osteoblasts; assist in the maintenance and support of growing skeletal tissue
<b>patella</b>	kneecap
<b>pelvic curvature</b>	the lowest section of the spinal cord which contains the sacrum, pelvis, and coccyx
<b>pelvis</b>	hipbones
<b>periosteum</b>	permeable covering over bones which allows for nutrient/waste transfer and sites for attachment by tendons
<b>red bone marrow</b>	found within spongy bone tissue of long bones; site of blood cell production
<b>rib cage</b>	twelve pairs of ribs attach to the thoracic curvature of the spine
<b>sacrum</b>	five vertebrae which are fused together forming one part of the pelvic curvature
<b>short bones</b>	found in wrists and ankles; allows the body to move more freely
<b>spinal cord</b>	a large bundle of nerve fibers protected within the vertebral column
<b>spongy bone tissue</b>	porous, highly vascular inner portion of bones
<b>sternum</b>	breastbone; attaches the first seven pairs of ribs

<b>synovial fluid</b>	fluid found within a sealed pocket containing a synovial joint; helps to lubricate the fibro-cartilage between the bones
<b>synovial joints</b>	all freely moving joints in the human body such as those found in the shoulders, knees, elbows, wrists, etc.
<b>tendons</b>	a type of connective tissue proper which connects muscles to bones
<b>thoracic (chest) curvature</b>	a section of the spinal cord which contains twelve vertebrae and is attached to the ribs
<b>vertebrae</b>	small bones of the backbone
<b>vertebral column</b>	the backbone or spine
<b>yellow bone marrow</b>	storehouse for fat; found in the long hollow area within the diaphysis of long bones

## Sample questions to ask your child after completing the weekly reading.

**Name five functions of the skeletal system:**

*Support, protection, movement, blood formation, and mineral storage*

**Where are the short bones located and what function do they support?**

*The short bones are found in the wrists and ankles and their functions are usually to allow our bodies to move more freely.*

**How is the thickness of new skeletal tissues maintained within our bones?**

*Osteoblasts continue to produce new skeletal tissue while osteoclasts secrete proteins which act to destroy these tissues. The osteoblasts continue to form new bone tissue at the same rate as the osteoclasts are destroying it thereby maintaining a stable thickness of the bones.*

**What prevents bones within a synovial joint from rubbing together?**

*The ends of both bones within a synovial joint are covered with a layer of slippery hyaline cartilage which allows for the bones to slide against each other easily. In addition, a synovial joint is entirely contained within a sealed fluid-filled "pocket" which is filled with synovial fluid. This fluid helps to lubricate the cartilage between the bones.*

# Day Two:

Your child should check their work on the practice worksheets today with the answer key on the next page.

In addition, your child should read the lab activity and start collecting all of the necessary materials!

# Answer Key for Practice Problems

## Vocabulary Review

- 1) false ribs
- 2) spinal cord
- 3) lumbar curvature (small of the back)
- 4) thoracic (chest) curvature
- 5) ligaments
- 6) tendons
- 7) synovial joints
- 8) extremities
- 9) irregular bones
- 10) axial skeleton
- 11) sternum
- 12) osteoclasts
- 13) epiphysis
- 14) sacrum
- 15) flat bones
- 16) synovial fluid
- 17) hyaline
- 18) short bones
- 19) red bone marrow
- 20) compact bone tissue
- 21) pelvis
- 22) mandible
- 23) cartilaginous joints
- 24) fibrous joints
- 25) articulation
- 26) patella
- 27) floating ribs
- 28) diaphysis
- 29) osteocytes
- 30) periosteum
- 31) spongy bone tissue
- 32) ossification
- 33) vertebrae
- 34) yellow bone marrow
- 35) coccyx
- 36) vertebral column
- 37) appendicular skeleton
- 38) pelvic curvature
- 39) osteoblasts
- 40) hematopoiesis
- 41) long bones
- 42) cervical (neck) curvature
- 43) rib cage
- 44) epiphyseal plates (growth plates)



## Multiple Choice

1) D

2) E

3) D

4) B

5) E

6) E

## Application Question

The fracture might have damaged the epiphyseal plate in Sally's right leg. Even though the bone healed properly, the damaged leg did not produce as much cartilage within this joint as did the undamaged leg as Sally continued to grow and develop. The result would be a shorter bone in her right leg.

# Day Three: Lab Activity

Your child should have already read through this lab and has been reviewing all of this week's vocabulary words.

**Collect your supplies for the lab:**

Three chicken leg bones (or smaller bones if possible)

Vinegar

Oven

Cookie sheet and foil

Small drinking glass

Small cooking pan