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TEACHER GUIDE

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Before You Read

NAME: _____

The Skeletal System – Bones

1. Use your dictionary to look up the meanings of the words below. Write the definition in the space beside each word.

compact	
marrow	
support	
spongy	
protection	
layer	

2. Complete each sentence with a word from the list. Use a dictionary to help you.

bones **skeleton** **skull** **ribs** **marrow** **calcium**

a) _____ is a mineral in bone that makes it strong.

b) Our system of bones is called our _____.

c) Red blood cells are created deep inside our bones in the _____.

d) You cannot *see* your _____ because they are under your skin – but you can *feel* them.

e) Our _____ is the bone that protects our brain.

f) Important organs like our heart and lungs are kept safe behind our _____

NAME: _____

Reading Passage

The Skeletal System – Bones

All of the bones in your body make up your **skeleton**. Your skeleton is also called the **skeletal system.**

STOP

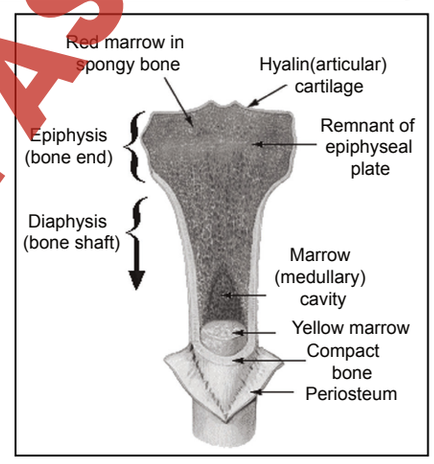
1. Write TWO things you know about bones or your skeleton.

_____

2. Write a QUESTION that you have about bones or your skeleton.

_____

You have probably never seen any of your bones, but you can feel their hardness through your skin. It's this hardness that allows bones to do two important jobs: give **support** and give **protection.** The skeleton gives the body structure and support like the veins in an umbrella. Without bones humans would not be able to move, run or even stand. Bones also protect other parts of our body. For example, the brain is protected by the skull; the liver, heart and lungs are covered by the ribs; and the spinal cord is inside the back bones.



The Parts of a Bone

All bones are made of living cells, blood **vessels** and nerves. They usually have *three layers.*

Compact Bone: The first, outside layer is thin, strong and hard bone. This compact bone contains calcium which makes it tough.

Spongy Bone: The second, middle layer has many tiny holes and looks like "cleaning sponge". The holes allow spongy bone to be strong, but not too heavy.

Bone Marrow: The third, inside layer is made of a soft jelly-like substance called bone marrow. This is where red blood cells are made.

STOP

3. In your own words, write ONE thing you have learned about bones or the skeleton. Write your answer in a complete sentence.

_____

After You Read

NAME: _____

The Skeletal System – Bones

1. Put a check mark (✓) next to the answer that is most correct.

a) Why is it important that bones are hard?

- ○ **A** to give our body support
- ○ **B** to keep our muscles strong
- ○ **C** to give us support and protection
- ○ **D** so it is easier to make red blood cells

b) Bone marrow is the third inside layer of bone. What does bone marrow do?

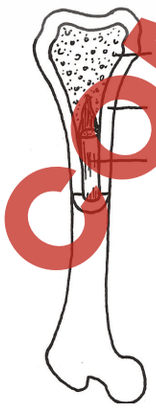
- ○ **A** give our body strength
- ○ **B** protects the rest of the bone
- ○ **C** creates red blood cells
- ○ **D** creates calcium

c) What is the skeletal system made of?

- ○ **A** bones and muscles
- ○ **B** bones
- ○ **C** bones and veins
- ○ **D** bones and the brain

2. Here is a picture of a bone. It shows each of the **three layers** that we have learned about. **Label** each layer with the correct name.

bone marrow **compact bone** **spongy bone**



a) _____

b) _____

c) _____

After You Read

NAME: _____

The Skeletal System – Bones

3. What are the three layers of bone?

_____

_____

_____

4. The middle layer of our bones is light. What would happen if it was heavy instead?

_____

_____

5. What are three organs that are protected by the ribs? Can you think of a fourth organ that is also protected by the ribs?

_____

_____

Extension & Application

6. Humans are **protected** by their skeleton. A turtle is protected by a hard shell. In this way, it does the same job as a skeleton. Do some research to learn more about a turtle's shell and the human skeleton. Then, **compare** the skeleton and a turtle's shell. How are they similar and how are they different? Here are some questions for you to consider as you collect your facts:

- **What do they look like?**
- **Where is each located in the body (i.e., on the inside or on the outside?)**
- **What other job or jobs, besides protection, does each do?**
- **How do they grow?**
- **What do they need to stay healthy?**

Present your findings as a one-page report. Add pictures if you like.

7. Do some research to find out **three diseases** that affect the bones in the human body. Also, look for information on ways to keep our bones **healthy**. Copy this T-chart into your notebook. Complete the chart with the information you collect. Share your findings with a classmate.

3 Diseases of the Bones	3 Ways to Keep the Bones Healthy

Hands-On Activity #1

Build Your Own Cell

We have learned that human body cells can be different shapes and sizes, but they all have some parts in common.

Do you remember what they are?

1. The **cell membrane** is the outside covering that separates the cell from its environment.
2. The **cytoplasm** is the jelly-like substance inside the cell where all the work takes place.
3. The **nucleus** floats in the cytoplasm and contains DNA.
4. The **mitochondria** float in the cytoplasm too, and turn food into energy.
5. The **lysosomes** also float in the cytoplasm and keep the cell clean.

FOR THIS ACTIVITY, you will need:

- 5 different colors of plasticine
- 5 toothpicks
- small pieces of paper
- tape

STEPS:

1. Use plasticine to **sculpt** your cell. First, decide what shape it will be. Remember that human body cells can be long and thin, round, or rectangular in shape. Use a different **color** for each cell part. The cell should be **at least** the size of your hand.
2. Once you have finished sculpting your cell, place the toothpicks in the plasticine. You will use them as markers for the different cell parts.
3. On a small piece of paper, write down the cell part. "Flag" it by sticking the toothpick in the plasticine.
4. Tape the label (small piece of paper) to the toothpick.

When you are finished, someone should be able to look at your plasticine cell and see the five different parts labeled. Have fun sculpting!

After You Read

NAME: _____

Crossword Puzzle!

Across

1. Muscle tissue changes size by _____ and lengthening
3. The human body is made of _____ cells
4. Muscle_____ are like elastic string
6. Humans are_____ organisms
8. The knee is an example of a _____ joint
10. _____ muscles allow our bones to move
11. Cells group together to form _____
13. The cell contains special information called _____
14. There are _____ major organ systems in the human body

Down

1. The liquid inside a cell is called _____
2. The skeletal system is made of bones, joints and _____
4. The heart is made of _____ muscle
5. Nerve tissue carries messages from the brain in the form of electrical _____
7. The digestive system is made of mostly _____ muscles
9. Muscles work in _____; one shortens and the other lengthens
12. Mitochondria turn food into _____

Word List

specialized	cytoplasm
contracting	energy
DNA	cardiac
cells	involuntary
tissues	pairs
hinge	cartilage
multicellular	signals
eight	skeletal

After You Read

NAME: _____

Comprehension Quiz

32

Part A

Circle T if the statement is TRUE or F if it is FALSE.

8

T F 1) The cell nucleus contains hereditary information called DNA.

T F 2) In the human body, organs are made of groups of tissue that have a specific job.

T F 3) Organ systems are simpler than organs.

T F 4) Three of the major organ systems in the human body are the respiratory system, skeletal system and brain system.

T F 5) In the circulatory system, the heart pumps blood through our nerves.

T F 6) The main jobs of the skeletal system is to give protection and support.

T F 7) The ends of our bones are covered by a rubbery material called cytoplasm.

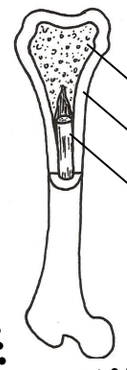
T F 8) Skeletal muscles control the digestion of food in our stomach.

Part B

On the diagram below, label the three layers of bone.
Use the words in the list.

6

bone marrow **spongy bone** **compact bone**



1. _____
2. _____
3. _____

SUBTOTAL: /14

Skeletal Runner

Hands-On Activity #3

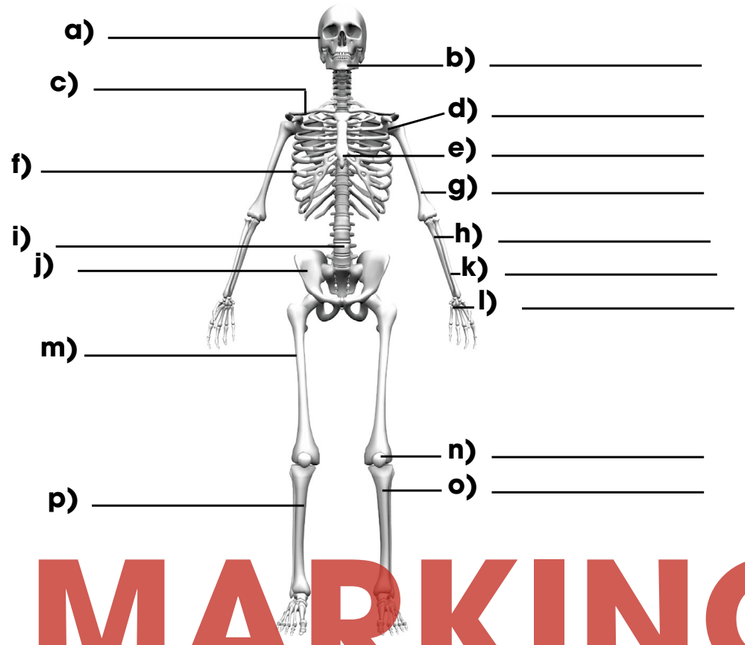
Invent an Alien Skeleton!

This activity has two parts. For the first part, you will label the bones in the human skeleton. For the second part, you will use what you have learned to invent your own extra-terrestrial skeleton.

Part 1

Use the words in the list to **label** the bones on the skeleton. You may need to do some research to complete this part.

ribs
patella
backbone
pelvis
femur
tibia
scapula
sternum
humerus
fibula
clavicle
radius
phalanges
ulna
mandible



Part 2

Now, it is time to **draw** your own **alien skeleton!** You must use **at least ten** different skeleton parts from the diagram above. You may use the parts more than once if you like. Be as imaginative as you can! Draw your skeleton on a separate sheet of paper. Above your drawing, copy and complete the following:

Hello! I am an extra-terrestrial from the planet _____.

My name is _____ and my favorite food is _____.

I have _____ skulls, _____ femurs, _____ tibias, and _____ ribs.

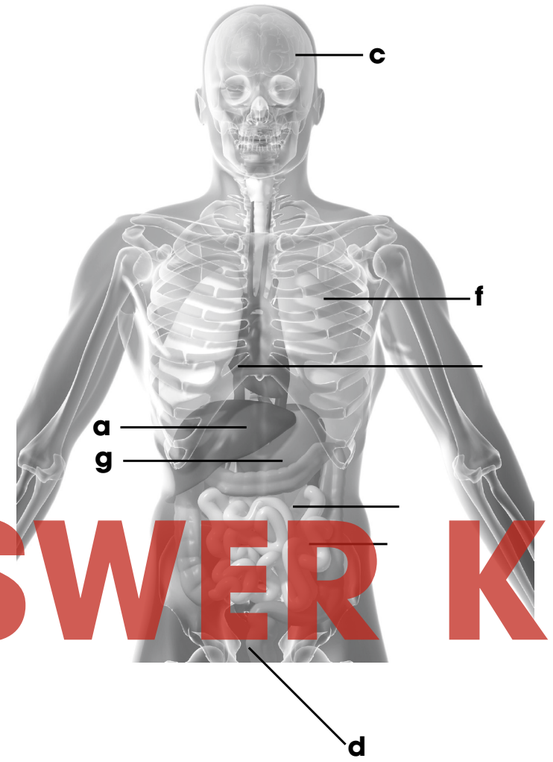
EASY

Answers will vary

Answers will vary

Part 1

a) skull
b) mandible
c) clavicle
d) scapula
e) sternum
f) ribs
g) humerus
h) ulna
i) backbone
j) pelvis
k) radius
l) phalanges
m) femur
n) patella
o) tibia
p) fibula



Part 2

Answers will vary

EASY MARKING ANSWER KEY