Healthy Skeletal and Muscular Systems

Teacher’s Guide
Middle School

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A Message from our Company...

Dear Educator:

Thank you for your interest in the educational videos produced by the Visual Learning Company. We are a Vermont-based, family owned and operated business specializing in the production of quality educational science videos and materials.

We have a long family tradition of education. Our grandmothers graduated from normal school in the 1920's to become teachers. Brian’s mother was an elementary teacher and guidance counselor, and his father was a high school teacher and superintendent. This family tradition inspired Brian to become a science teacher, and to earn a Ph.D. in education, and led Stephanie to work on science educational programs at NASA.

In developing this video, accompanying teacher’s guide, and student activities, our goal is to provide educators with the highest quality materials, thus enabling students to be successful. In this era of more demanding standards and assessment requirements, supplementary materials need to be curricular and standards based - this is what we do!

Our videos and accompanying materials focus on the key concepts and vocabulary required by national and state standards and goals. It is our mission to help students meet these goals and standards, while experiencing the joy and thrill of science.

Sincerely,

Brian and Stephanie Jerome
Healthy Skeletal and Muscular Systems

National Standards Correlations

National Science Education Standards
(Content standards: 5-8, National Academy of Sciences)

Life Science - Content Standard C:
As a result of their activities in grades 5-8, all students should understand that:

- Specialized cells perform specialized functions in multicellular organisms. Groups of specialized cells cooperate to form a tissue, such as a muscle. Different tissues are in turn grouped together to form larger functional units, called organs. Each type of cell, tissue, and organ has a distinct structure and set of functions that serve the organism as a whole.

- The human organism has systems for digestion, respiration, reproduction, circulation, excretion, movement, control, and coordination, and for protection from disease. These systems interact with one another.

Science in Personal and Social Perspectives (Content Standard F - Personal Health)

- Regular exercise is important to the maintenance and improvement of health. The benefits of physical fitness include maintaining healthy weight, having energy and strength for routine activities, good muscle tone, bone strength, strong heart/lung systems, and improved mental health. Personal exercise, especially developing cardiovascular endurance, is the foundation of physical fitness.

Benchmarks for Science Literacy
(Project 2061 – AAAS)

The Human Organism - Human Identity (6A), Physical Health (6E).
By the end of 8th grade, students should know that:

- Like other animals, human beings have body systems for obtaining and providing energy, defense, reproduction, and the coordination of body functions.

- The amount of food energy (calories) a person requires varies with body weight, age, sex, activity level, and natural body efficiency. Regular exercise is important to maintain a healthy heart/lung system, good muscle tone, and bone strength.
Student Learning Objectives

Upon viewing the video and completing the enclosed student activities, students will be able to do the following:

- Understand that bone is the principle structural material of the skeletal system, and a tough, hard, living material.

- State some of the functions of the skeletal system: provides structure for the body, protects vital organs, and produces red blood cells.

- Provide examples of common joints in the body such as the knee, elbow, and wrist.

- Explain the role ligaments play in connecting bones together at joints.

- Understand the importance of eating a balanced diet in helping to maintain a healthy skeletal system.

- Describe muscles as tissues in the body made up of special muscle cells or muscle fibers.

- Differentiate and compare skeletal muscle, smooth muscle, and cardiac muscle.

- Provide an example of structures in the body made up of the different kinds of muscle.

- Understand the importance of regular exercise in maintaining a healthy muscular system.

- Comprehend the dangers of using illegal muscle-enhancing products such as steroids and other chemicals. Understand that these could cause long lasting, serious health problems.

- Describe some of the common problems which may occur with the muscular system such as contusions, muscle strains, and muscle cramps.
Assessment

Preliminary Assessment:
The Preliminary Assessment, provided in the Student Masters section, is an assessment tool designed to gain an understanding of students’ pre-existing knowledge. It can also be used as a benchmark upon which to assess student progress based on the objectives stated on the previous pages.

Video Review:
The Video Review, provided in the Student Masters section, can be used as an assessment tool or as a student activity. There are two main parts. The first part contains questions that can be answered during the video. The second series of ten questions consists of a video quiz to be answered at the conclusion of the video.

Post Assessment:
The Post Assessment, provided in the Student Masters section, can be utilized as an assessment tool following completion of the video and student activities. The results of the Post Assessment can be compared against the results of the Preliminary Assessment to evaluate student progress.
Introducing the Video

Before showing students the video program ask them to roll their fingers into a fist and then straighten them out. Next, instruct them to bend their arm back and forth at the elbow. Finally, tell students to rotate their feet at the ankles. Now ask students what structures in the body enabled them to make these movements. Explain to the class that bones make up the skeletal system. The skeleton provides a framework for the body, similar to a house that is built on a framework of wood. Explain to students that muscles are tissues which are attached to the skeleton. Muscles enable us to move. There are hundreds of different bones and muscles in the body enabling us to do amazing things. Tell students to pay close attention to the program to learn more about the fascinating characteristics and features of the skeletal and muscular systems.

Following the video discuss some of the characteristics and functions of the skeletal and muscular systems. Also discuss some of the common problems which may occur in these systems.

Video Viewing Suggestions

The student Master “Video Review” is provided for distribution to students. You may choose to have your students complete this Master while viewing the program or to do so upon its conclusion.

The program is approximately twenty minutes in length and includes a ten question video quiz. Answers are not provided to the Video Quiz on the video, but are included in this teacher’s guide. You may choose to grade student quizzes as an assessment tool or to review the answers in class.

The video is content-rich with numerous vocabulary words. For this reason you may want to periodically stop the video to review and discuss new terminology and concepts.
1. Blink your eyes.
2. Move your thumb.
3. Bend your leg.
4. These very simple actions involve movements of the muscular and skeletal systems.
5. Nearly everything we do from throwing a ball, ...
6. ...or playing an instrument, ...
7. ...to writing, involves the skeletal and muscular systems.
8. Without these systems we couldn’t move, talk, or carry out our daily lives.
9. How do these systems work?
10. What problems can occur with these systems?
11. And what are some of the things we should do to take care of these systems?
12. During the next few minutes we are going to take a look at these questions and others...
13. ...as we explore the health of the skeletal and muscular systems.
14. **Graphic Transition – Your Skeletal System**
15. Make a fist and lightly tap your head.
16. **You Observe!** Describe how your head feels.
17. It feels hard – nearly as hard as a rock.
18. Why? This is because your skull, which lies under a thin layer of skin, is made up of a hard material called bone.
19. “Bone” is the principle structural material of the skeletal system. It is a tough, hard material made up of a variety of elements including minerals.
20. When you observe the dried bone of an animal, you tend to think of bone as non-living.
21. But bones are actually living tissue made of cells.
22. The cells in bones use energy and oxygen for growth and repair.
23. Another material called “cartilage” is also found in the skeletal system.
24. Cartilage is a soft connective tissue which is found at the end of bones, between your vertebrae in your backbone, and in your nose and ears.
25. The skeletal system performs many important functions.
26. It is often referred to as the framework of the body because it provides structure for the body.
27. Without the skeletal system we would be shapeless.
28. The skeletal system also enables the human body to move.
29. Certain parts of the skeletal system also protect vital organs.
30. The breastbone and ribs, for example, protect the lungs and heart.
31. In addition, some bones in the skeletal system carry out the important job of producing red blood cells.

32. Graphic Transition – The Skeletal System in Action
33. It is remarkable to think about all that a skeletal system does in a single day.
34. One of the most important functions of the skeletal system is movement.
35. The skeleton is uniquely designed for movement through the use of joints.
36. The knee, elbow, wrist, and ankle are all examples of joints.
37. A “joint” is a place where two or more bones come together.
38. Place your hand on your elbow and bend your arm back and forth.

40. As you bend your arm you can actually feel where the bones come together at the joint.
41. Most joints allow for movement, and there are many different types of joints.
42. Cartilage, the connective tissue we mentioned earlier, is present at the ends of bones at joints. Cartilage enables the ends of bones to move smoothly against each other.
43. Strong cord-like elastic tissues called “ligaments” connect bones at joints, holding the bones in place.

44. Graphic Transition – Caring for Your Skeletal System
45. You probably don’t think about taking care of your skeleton that often because it is hidden inside the body.
46. But there are several things you should do everyday to take care of this body system.
47. One of the most important things you can do for bone strengthening and growth is to eat a healthy balanced diet.
48. Bones need a wide variety of vitamins as well as minerals such as calcium.
49. Milk products, fruits, vegetables, and whole grains contain these valuable nutrients.
50. As adolescents it is very important to eat a balanced diet, to provide your bones with the ingredients they need for growth and development.
51. In addition to eating a diet rich in vitamins and minerals, regular exercise is also important.
52. But, sometimes people experience bone and skeletal injuries while exercising.
53. Many of these injuries could have been prevented through the proper use of safety equipment.
54. Wearing a helmet while bicycling,...
55. ...skateboarding,...
56. ...skiing, and snowboarding helps protect the skull and the brain in the event of an accident, reducing your chance of a severe injury.
57. Wearing other protective equipment and padding protects other parts of the body from injury.

58. **Graphic Transition – Problems of the Skeletal System**
59. This is an x-ray of a bone.

60. **You Decide!** What is wrong with this bone?
61. That’s right, it is broken.

62. Bones are hard, however, they can occasionally break.
63. A “fracture” is a break in a bone, usually caused by an accident or an injury.
64. Sometimes fractures require a cast or surgery.
65. Because bones are living tissue, a fracture can repair itself over time.
66. Perhaps you have sprained your ankle while running or walking.
67. Or maybe you sprained a finger while catching a ball.
68. A sprain occurs when ligaments at a joint are stretched or torn.
69. Usually a sprain involves pain and swelling.
70. Another type of skeletal problem called “osteoporosis” is a disease in which bone density decreases.
71. This causes bones to become weak and more prone to fractures.
72. Osteoporosis tends to be more common in older women. It is minimized through exercise, diet along with appropriate minerals such as calcium and vitamins.

73. **Graphic Transition – Your Muscular System**
74. You may think this person has a lot of muscles.
75. But actually, each of us has the same number of muscles. It’s just that some people have bigger and stronger muscles.
76. What exactly is muscle?
77. “Muscle” is tissue in the body made up of special muscle cells or muscle fibers. Muscle fibers contract and relax to cause movement.
78. Your heart is made of a special type of muscle called cardiac muscle.
79. **You Decide!** Does your stomach contain muscle?
80. Yes, the stomach and intestines contain another type of muscle called smooth muscle.
81. A third type of muscle called skeletal muscle is attached to bones. Skeletal muscles enable us to move.
82. Tough tissues called “tendons” attach muscles to bones.
83. While the skeleton provides the framework the attached muscles allow it to move. So as you can see the muscular system and the skeletal system work in tandem.
84. For this reason the skeletal and muscular systems are sometimes referred to as the “musculo-skeletal system.”

85. Graphic Transition – Caring for Your Muscles
86. Eating a well balanced diet is very important in caring for your muscles.
87. Muscle growth and maintenance require adequate protein, carbohydrates, and a wide array of minerals and vitamins.
88. It is also important to rest tired or overly exerted muscles.
89. To keep muscles fit, regular exercise is essential.
90. A wide range of exercises utilizing a variety of muscle groups is critical.
91. Aerobic exercise in which the body utilizes higher amounts of oxygen is not only good for skeletal muscle but for cardiac muscle as well.
92. Stay away from products that promise to increase your muscle mass and strength.
93. And never use illegal drugs such as steroids or other muscle enhancing chemicals. These could cause long lasting, serious health problems.

94. Graphic Transition – Problems of the Muscular System
95. If you have ever bumped into something or gotten hit hard....
96. ...you have probably gotten a black and blue mark called a contusion or bruise.
97. A “contusion” occurs when muscle tissue is injured and blood vessels are broken, causing a discoloration under the skin.
98. Contusions usually heal after a few days.
99. Sometimes when muscles are overworked or over stretched they become strained.
100. Rest, cold packs, and later pain-free gentle stretching exercises are recommended for the treatment of a muscle strain.
101. A more serious injury than a strained muscle is a torn muscle.
102. In a torn muscle the muscle is actually torn apart or torn from the bone.
103. Rest or even surgery is sometimes required to treat a torn muscle.
104. Have you ever felt a terrible pain in your leg muscles during or after exercise?
105. This may be a “cramp,” sometimes called a “charley horse.” A cramp is a painful, involuntary muscle contraction.
106. A person can get a muscle cramp to subside by stretching and applying ice packs.
107. Sometimes a problem arises not with muscles but with tendons. “Tendonitis” involves the inflammation of the tendon usually caused by excessive exercise.
108. Tendonitis is commonly treated with rest, and sometimes with medication.

109. **Graphic Transition – Summing Up**

110. During the past few minutes we have explored some of the fascinating features of the skeletal and muscular systems, and the health of these systems.
111. We began by investigating living tissue called bones – the basis of the skeletal system.
112. We also discussed some of the functions of this system. How it provides a framework for the body, how it protects vital organs, facilitates movement, and how it produces red blood cells.
113. We also discussed the role joints and ligaments play in the process of movement.
114. Some essential things you should do to take care of your skeletal system were also described such as eating a balanced diet, exercising regularly, and using safety equipment while doing certain activities.
115. Problems may sometimes arise with the skeletal system such as bone fractures.
116. We took a look at the muscular system as well, which works with the skeletal system to produce movement.
117. Eating a balanced diet, regular aerobic exercise, and rest are all things you can do to maintain a healthy muscular system.
118. Finally, we briefly explored some of the problems which may effect muscles including contusions, strains, cramps, and torn muscles or tendons.
119. So, the next time you take a walk...
120. ...do some work,...
121. ...or play a sport, think about some of the things we discussed during the past few minutes.
122. You just might think about the health of your skeletal and muscular systems a little differently.
Script (cont.)

123. Graphic Transition – Video Assessment
Fill in the correct word to complete the sentence. Good luck and let’s get going!
1. The _______ is the framework of the body.
2. _____ is the structural material of the skeletal system.
3. Bone is actually _______ tissue made of cells.
4. A_____ is a place where two or more bones come together.
5. When bicycling, snowboarding, and skateboarding always wear a _______.
6. A________ is a break in a bone.
7. A_____ may occur when ligaments are stretched at a joint.
8. ______ fibers expand and contract to cause movement.
9. Regular aerobic _______ is important in keeping muscles fit.
10. A muscle _______ can be caused by over stretching or overuse of muscles.

Answers can be found on page 17
Healthy Skeletal and Muscular Systems

Student Assessments and Activities

Assessment Masters:

• Preliminary Assessment

• Video Review

• Post Assessment

Student Activity Masters:

• Muscles in the Body

• Joints and Joint Problems

• Bruises and Strains

• Vocabulary of Healthy Skeletal and Muscular Systems
Answers to Student Assessments

Preliminary Assessment (pgs. 20-21)
1. skeletal
2. bone
3. joint
4. fracture
5. helmet
6. muscles
7. tendons
8. exercise
9. contusion
10. balanced
11. true
12. true
13. false
14. true
15. false
16. true
17. false
18. false
19. true
20. true

Video Quiz (p. 22)
1. skeleton
2. bone
3. living
4. joint
5. helmet
6. fracture
7. sprain
8. muscle
9. exercise
10. strain

Post Assessment (pgs. 23-24)
1. contusion
2. tendons
3. helmet
4. joint
5. skeletal
6. balanced
7. exercise
8. muscles
9. fracture
10. bone
11. true
12. false
13. false
14. false
15. true
16. true
17. false
18. true
19. true
20. true

Video Review (p. 22)
1. Your head feels hard because your skull, which lies under a thin layer of skin, is made up of a hard material called bone.
2. When you place your hand on your elbow and bend your arm back and forth, you can actually feel where the bones come together at the joint.
3. The bone is broken or “fractured” which is usually caused by an accident or injury.
4. Yes, the stomach contains a type of muscle called smooth muscle.
# Answers to Student Activities

## Vocabulary of Healthy Skeletal and Muscular Systems (p. 30)

1. h - skeletal system
2. j - bone
3. a - joint
4. d - calcium
5. b - fracture
6. g - osteoporosis
7. c - tendons
8. f - ligaments
9. i - contusion
10. e - tendonitis

## Hinge Joint

1. The hinge joint bends mainly in one plane, back and forth.
2. An advantage of a hinge joint is that it allows for a wide range of movement in one plane.
3. The fingers are another example of a hinge joint.
4. A hinge joint can be hyperextended; can also be dislocated.

## Gliding Joint

1. This joint moves laterally (side to side). No, the knee cannot do this.
2. A gliding joint allows side to side movement.
3. Another example of gliding joints are the joints between vertebrae.
4. An injury might occur in a gliding joint. The bones can be fractured or the surfaces may be injured.

## Ball and Socket Joint

1. A ball and socket joint allows movement in all directions (360°).
2. An advantage of a ball and socket joint is that it allows a great deal of movement in all directions.
3. Another example of a ball and socket joint is the hip.
4. An injury that might occur in a ball and socket joint is it can be dislocated. Arthritis in the hip is also relatively common in older people.

## Treatments for Joint Problems

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<thead>
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<th>Treatment</th>
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<td>C 6</td>
</tr>
<tr>
<td>contusion</td>
<td>A 5</td>
</tr>
<tr>
<td>tendinitis</td>
<td>E 1</td>
</tr>
<tr>
<td>bursitus</td>
<td>D 3</td>
</tr>
<tr>
<td>strain</td>
<td>B 4</td>
</tr>
<tr>
<td>cramp</td>
<td>F 2</td>
</tr>
</tbody>
</table>

## Bruises and Sprains (p. 29)

- Fracture: C 6
- Contusion: A 5
- Tendinitis: E 1
- Bursitus: D 3
- Strain: B 4
- Cramp: F 2

## Joints and Joint Problems (p. 27-28)

### Hinge Joint
1. The hinge joint bends mainly in one plane, back and forth.
2. An advantage of a hinge joint is that it allows for a wide range of movement in one plane.
3. The fingers are another example of a hinge joint.
4. A hinge joint can be hyperextended; can also be dislocated.

### Gliding Joint
1. This joint moves laterally (side to side). No, the knee cannot do this.
2. A gliding joint allows side to side movement.
3. Another example of gliding joints are the joints between vertebrae.
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### Ball and Socket Joint
1. A ball and socket joint allows movement in all directions (360°).
2. An advantage of a ball and socket joint is that it allows a great deal of movement in all directions.
3. Another example of a ball and socket joint is the hip.
4. An injury that might occur in a ball and socket joint is it can be dislocated. Arthritis in the hip is also relatively common in older people.
Assessment and Student Activity Masters
**Preliminary Assessment**

**Directions:** Fill in the blank with the correct word. A list of possible answers is provided at the bottom of the page.

1. The ____________ system is the framework of the human body.
2. ____________ is the main structural material of the skeletal system.
3. A ____________ is where two or more bones come together.
4. A ____________ is a break in a bone.
5. When bicycling or skateboarding always wear a ____________ to prevent head injuries.
6. ____________ are tissues which help the body move.
7. Tough tissues called ____________ attach muscles to bones.
8. To keep muscles fit, regular ____________ is essential.
9. A black and blue mark on the skin resulting from an injury to a muscle is called a ____________.
10. It is very important to eat a ____________ diet to care for the skeletal and muscular systems.

- tendons
- joint
- balanced
- helmet
- skeletal
- contusion
- bone
- muscles
- exercise
- fracture
Preliminary Assessment

Directions: Decide whether the statement is true (T) or false (F).

11. Bones in the body are actually living tissue. T F

12. Cartilage is a material located in your ears and nose. T F

13. The skeletal system does not play a role in movement. T F

14. Ligaments connect bones to bones. T F

15. A sprain involves a fracture in a bone. T F

16. Osteoporosis is a disease in which bone density decreases. T F

17. The body has just one type of muscle. T F

18. Aerobic exercise involves the body using small amounts of oxygen. T F

19. A strain may occur when muscles are overworked or overstretched. T F

20. Muscle fibers expand and contract to cause movement. T F
Healthy Skeletal and Muscular Systems

Name ____________________________

**Video Review**

**Directions:** During the course of the program, answer the questions as they are presented in the video. At the end of the video, answer the Video Quiz questions.

**You Observe!**
1. Describe how your head feels.

**You Observe!**
2. Describe what you feel.

**You Decide!**
3. What is wrong with this bone?

**You Decide!**
4. Does your stomach contain muscle?

**Video Quiz:** Fill in the correct word to complete the sentence.

1. The ____________ is the framework of the body.
2. __________ is the structural material of the skeletal system.
3. Bone is actually ________________ tissue made of cells.
4. A ____________ is a place where two or more bones come together.
5. When bicycling, snowboarding, and skateboarding always wear a ____________.
6. A ____________ is a break in a bone.
7. A ____________ may occur when ligaments are stretched at a joint.
8. ____________ fibers expand and contract to cause movement.
9. Regular aerobic _________________ is important in keeping muscles fit.
10. A muscle ____________ can be caused by over stretching or overuse of muscles.
Healthy Skeletal and Muscular Systems

Post Assessment

Directions: Fill in the blank with the correct word. A list of possible answers is provided at the bottom of the page.

1. A black and blue mark on the skin resulting from an injury to a muscle is called a ____________________.

2. Tough tissues called _______________ attach muscles to bones.

3. When bicycling or skateboarding always wear a _____________ to prevent head injuries.

4. A _______________ is where two or more bones come together.

5. The ______________ system is the framework of the human body.

6. It is very important to eat a ___________________ diet to care for the skeletal and muscular systems.

7. To keep muscles fit, regular ________________ is essential.

8. ______________ are tissues which help the body move.

9. A ________________ is a break in a bone.

10. ______________ is the main structural material of the skeletal system.

Possible answers:
- fracture
- exercise
- contusion
- helmet
- bone
- muscles
- tendons
- skeletal
- balanced
- joint
Post Assessment

Directions: Decide whether the statement is true (T) or false (F).

11. A strain may occur when muscles are overworked or overstretched. T F

12. The body has just one type of muscle. T F

13. A sprain involves a fracture in a bone. T F

14. The skeletal system does not play a role in movement. T F

15. Bones in the body are actually living tissue. T F

16. Muscle fibers expand and contract to cause movement. T F

17. Aerobic exercise involves the body using small amounts of oxygen. T F

18. Osteoporosis is a disease in which bone density decreases. T F

19. Ligaments connect bones to bones. T F

20. Cartilage is a material located in your ears and nose. T F
Muscules in the Body

Background: Have you ever woken up and felt sore after playing basketball or running the previous day? The soreness is most likely the result of overusing your muscles. Muscles are very important tissues in the body that perform a wide range of functions. Without muscles, we wouldn’t be able to walk, run, or move. The contraction and relaxation of muscle cells produces movement.

Humans and other vertebrate animals have three different kinds of muscle: skeletal muscle, cardiac muscle, and smooth muscle. The relaxing and contracting of skeletal muscles enable us to move. Skeletal muscle is attached to bone. Cardiac muscle, another type of muscle, is sometimes referred to as heart muscle. Cardiac muscle in the heart pumps blood throughout the body. The third type of muscle, smooth muscle, is found in a variety of organs including the stomach, intestines, the uterus in females, and in blood vessels.

We depend on our muscles to carry out a wide range of activities from digesting food, to pumping blood, to helping us get out of bed in the morning. Muscles therefore are extremely important to our existence. Unfortunately there are problems that may arise with our muscles. For example, skeletal muscles can be bruised, strained, sprained, or torn. Cardiac muscles can be damaged during a heart attack. And smooth muscle can be attacked by diseases such as cancer.

There are many things you can do to care for your muscles. Eating a well balanced diet is very important. Muscle growth and maintenance requires adequate protein, carbohydrates, and a number of vitamins and minerals. It is also important to rest tired or overly exerted muscles. To keep muscles fit, regular exercise is essential! Aerobic exercise, in which muscle tissue consumes high amounts of oxygen, is good for skeletal and cardiac muscles. It is also very important to stay away from substances that have a negative effect on the body such as drugs, alcohol, unhealthy foods, and muscle enhancing chemicals such as steroids. Having a regular physical examination by a medical professional is also vital in maintaining healthy muscles and a healthy body.
Muscles in the Body cont.

Directions:
Below are three images representing the three different types of muscle. Write the correct answer next to each structure.
1. Identify the structure and state the type of muscle of which it consists.
2. Describe the main function the muscle carries out in the body.
3. Explain a problem which may occur with this type of muscle.
4. Describe some of the things you should do to care for this structure/type of muscle.

A. 1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________

B. 1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________

C. 1. ____________________________
   2. ____________________________
   3. ____________________________
   4. ____________________________
Joints and Joint Problems

**Background:** A joint is the place where two or more bones come together. Your elbows and knees are examples of joints you may commonly think about because you use them often. But there are other joints in the body including joints in the skull, feet, neck, and shoulder to name just a few. There are several different types of joints in the human body. In this activity you will learn about the following types of joints: hinge joint, ball and socket joint, and a gliding joint.

**Activity:**

**Hinge Joint:**

1. Bend your knee back and forth. This is an example of a hinge joint. Describe the motion in a hinge joint.

2. What is the advantage or benefit of a hinge joint?

3. List another example of a hinge joint in your body.

4. Describe an example of an injury that might occur in a hinge joint.
Joints and Joint Problems cont.

**Gliding Joint:**

1. Slide your hand from side to side as if you were waving goodbye. Describe the motion at this joint. Can you do this with your knee?

2. What is the advantage or benefit of a gliding joint?

3. List another example of a gliding joint in the body.

4. Describe an example of an injury that might occur in a gliding joint.

**Ball and Socket Joint:**

1. Move your arm around in a circle over your head. Describe the motion of the joint in your shoulder.

2. What is the advantage or benefit of a ball and socket joint?

3. List another example of a ball and socket joint in the body.

4. Describe an example of an injury that might occur in a ball and socket joint.
Healthy Skeletal and Muscular Systems

Bruises and Strains

Background: There are many different injuries which may occur to the skeletal and muscular systems. Hopefully, such injuries are not serious, and can heal quickly. It is a good idea to be aware of various problems which may occur with these body systems and to know how to prevent injuries.

Directions: Using textbooks, medical reference books, the internet, and this video program research the problem in the left column. Then match it to its description. Finally match the common treatment to the injury.

<table>
<thead>
<tr>
<th>Description</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>fracture</td>
<td></td>
</tr>
<tr>
<td>contusion</td>
<td></td>
</tr>
<tr>
<td>tendinitis</td>
<td></td>
</tr>
<tr>
<td>bursitis</td>
<td></td>
</tr>
<tr>
<td>strain</td>
<td></td>
</tr>
<tr>
<td>cramp</td>
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</tbody>
</table>

Description of Problem
A. An injury to soft tissue such as muscle. Often caused by a blow. Sometimes referred to as a bruise.
B. Slight pain or muscle stiffness resulting from muscles being overworked or overstretched.
C. A break in a bone.
D. Pain and swelling in area of elbow, hip, knee, shoulder or other joint.
E. An inflammation of tendon.
F. Sometimes called a “charley horse.” A painful involuntary muscle contraction.

Possible Treatments
1. Rest is essential. Ice and elevating sometimes recommended. Medical examination sometimes recommended.
2. Relieve pain by stretching and apply cold packs.
3. Rest and anti-inflammatory medicine such as aspirin.
4. Rest of involved joint, cold packs, and later pain-free gentle stretching exercises.
5. Cold packs help reduce swelling. If serious see a doctor.
6. See a doctor immediately. Immobilization through a cast or splint is necessary. Serious fractures may require surgery.
Vocabulary of Skeletal and Muscular Systems

**Directions:** Unscramble the vocabulary words in the first column. Match the words to the definitions in the second column.

<table>
<thead>
<tr>
<th>Unscrambled Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>eellksat ytmsse</td>
<td>a. Place where two or more bones meet</td>
</tr>
<tr>
<td>oenb</td>
<td>b. a break in a bone</td>
</tr>
<tr>
<td>ijton</td>
<td>c. tough tissues which connect muscles to bones</td>
</tr>
<tr>
<td>ccuimla</td>
<td>d. an important mineral needed by bones</td>
</tr>
<tr>
<td>rtafecur</td>
<td>e. inflammation of a tendon</td>
</tr>
<tr>
<td>ersostioposo</td>
<td>f. strong cord-like elastic tissues which connect bones to bones</td>
</tr>
<tr>
<td>edntsno</td>
<td>g. a disease in which bone density decreases</td>
</tr>
<tr>
<td>gesimtlna</td>
<td>h. provides a framework for the body and performs many important functions</td>
</tr>
<tr>
<td>cnuinosot</td>
<td>i. occurs when muscle tissue is injured; often results in discoloration under the skin</td>
</tr>
<tr>
<td>osneittdin</td>
<td>j. living tissue which serves as main structural material of skeletal system</td>
</tr>
</tbody>
</table>