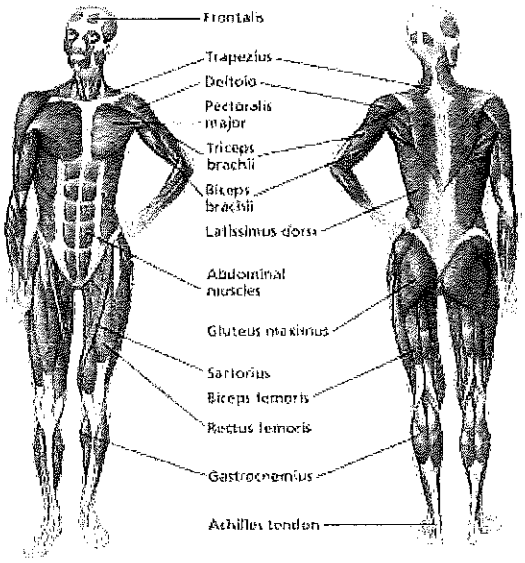
The Muscular System

Mrs. Ryan
6th Grade Health



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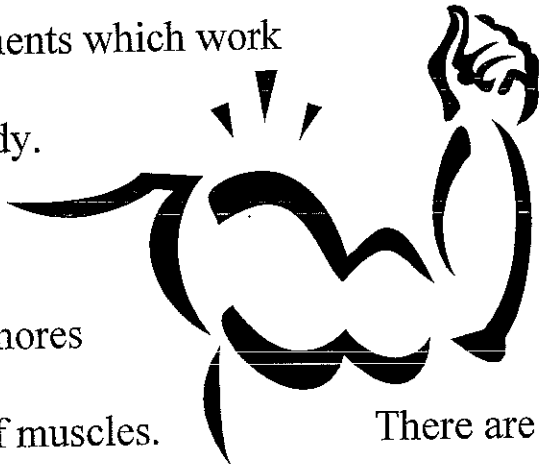
Muscular System Intro - 6th Grade Health

The human body has more than 650 muscles, which make up half of a person's body weight. They are connected to bones by tough, cord-like tissues called tendons, which allow the muscles to pull on bones. Muscles pull but they cannot push. Muscles are made up of millions of tiny protein filaments which work together to produce motion in the body. Because our bodily needs demand that muscles perform many different chores we are equipped with different types of muscles. There are **cardiac**, **smooth** and **skeletal** muscles that are always working in our bodies. Muscles move body parts by contracting and then relaxing. Your muscles can pull bones but they can't move them back to the original position. So they work in pairs. The flexor bends the joint and the extensor straightens the joint.



Muscular System Notes – 6th Grade Health

Muscles are made of:

There are over _____ muscles.

How do Muscles Work…

What is the primary function of our muscles…

What are Tendons…

/10

Muscular System Questions - 6th Grade Health

Please answer the following questions on the movie you saw.
Use the word bank to answer the questions.

cardiac	ligaments	alone
involuntary	relax	pairs
tendons	voluntary	skeletal

1. Muscle cells contract and _____.

2. Muscles that allow you to move are _____muscles.

3. Muscles are attached to bones by cords called_____.

4. Muscles that move without our conscious control are _____ muscles.

5. The heart is made of _____ muscles.

6. Muscles work in _____.

7. Which of the three types of muscles need rest_____?

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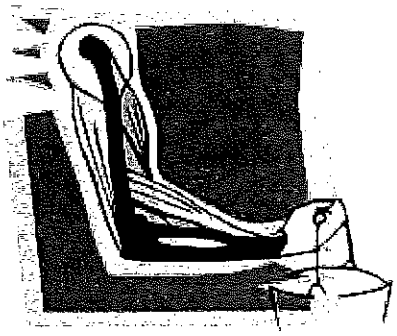
Shapes and Sizes of Muscles – 6th Grade Health



Do you remember playing when you were a young child? Did you like to group things like rocks by their shapes or colors? Did you put your toys away based on what they were - dolls, cars, or blocks? Did you group your baseball cards by teams? If you did, in a very simple way you were classifying things. Scientists and physicians do the same thing with muscles.

Three types of muscles:

You already know that there are three types of muscle tissue in your body. Your heart is made of cardiac muscle. In the digestive tract and the blood vessels, you can find smooth muscle. The muscles that are attached to bones for movement are the skeletal muscles.

Voluntary and involuntary:

You also know that the action produced from muscles can be voluntary or involuntary. The action you can control is voluntary. The action you can't control is involuntary. Your smooth muscle and cardiac muscle produce actions that are involuntary such as the beating of your heart. Your skeletal muscles, though, can do both. You can jump when you want to. You can change the channel on the remote if you wish. You can blink your eyes whenever you want, but your eyes will also blink if you aren't thinking about it.

Flexors or extensors:

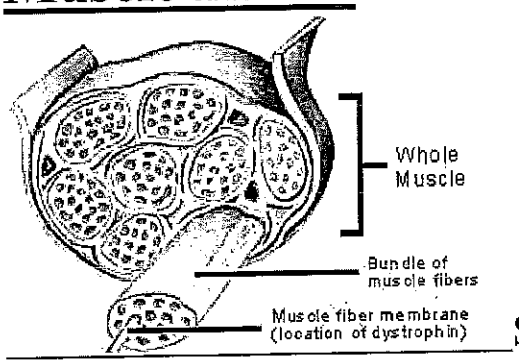
Some scientists group muscles based on whether they are flexors or extensors. Your skeletal muscles work in pairs. When one muscle in your arm contracts, the muscle opposite it relaxes so your arm moves. To bend your elbow, the biceps muscle contracts and the triceps muscle relaxes. To straighten your elbow, the biceps muscle relaxes and the triceps muscle contracts. The biceps muscle is a flexor. The

triceps muscle is an extensor. A muscle is called a flexor if it bends part of your body. A muscle is called an extensor if it straightens part of your body. A flexor muscle allows you to bend your arm at your elbow, raise your leg to kick a football, or bring your thumb across your palm. An extensor muscle allows you to stretch your leg or arm away from your body.

Large and small:

Muscles can also be grouped by shape, size, or position. For example, the muscles that make up the gluets are large and have to work against gravity. The muscles inside the eye, though, are tiny and need to move precisely. Did you know that the longest muscle in the body is the sartorius? Did you know that the smallest muscle is the stapedius in the ear? Which group do you think each would fall into - large or small?

Muscle fibers:



Skeletal muscle is made up of bundles of individual muscle fibers called myocytes. Each myocyte contains many myofibrils, which are strands of proteins that can grab on to each other and pull. This shortens the muscle and causes muscle contraction. It is generally accepted that muscle fiber types can be broken down into two main types: **slow twitch (Type I)** muscle fibers and **fast twitch (Type II)** muscle fibers.

There are many ways to classify muscles. Whatever way you look at it, though, muscles equal movement to you. What machine is capable of doing all of this other than the human body?

Shapes and Sizes of Muscles Review – 6th Grade Health

1. Smooth, skeletal, and cardiac muscles are the three types of muscle in your body.

   (A) False
   (B) True

2. Bones are moved by _____ muscle.

   (A) Cardiac
   (B) Skeletal
   (C) Smooth

3. A muscle is called a(n) _____ if it straightens part of your body.

   (A) Extensor
   (B) Flexor

4. There are two types of muscle fibers.

   (A) False
   (B) True

5. Bundles of muscle fibers are called_____.

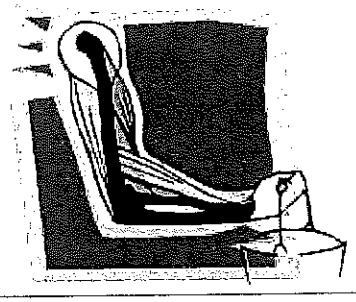
   (A) Leucocytes
   (B) Myocytes
   (C) Erythrocytes

6. Which is an example of cardiac muscle?

   (A) esophagus
   (B) Biceps
   (C) Heart
   (D) Blood vessels

7. The muscles in the gluets are small.

   (A) False
   (B) True



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TYPES OF MUSCLES - 6th Grade

Muscles are all made of the same material, a type of elastic tissue (sort of like the material in a rubber band). Thousands, or even tens of thousands, of small fibers make up each muscle.You have three different types of muscles in your body: **cardiac** (say: **kar**-dee-ak) muscle, **smooth** muscle, and **skeletal** (say: **skel**-uh-tul) muscle.

Cardiac Muscle

The muscle that makes up the heart is called cardiac muscle. It is also known as the **myocardium** (say: my-uh-**kar**-dee-um). The thick muscles of the heart contract to pump blood out and then relax to let blood back in after it has circulated through the body.

Just like smooth muscle, cardiac muscle works all by itself with no help from you. A special group of cells within the heart are known as the pacemaker of the heart because it controls the heartbeat.

Smooth Muscles

Smooth muscles — sometimes also called **involuntary muscles** — are usually in sheets, or layers, with one layer of muscle behind the other. You can't control this type of muscle. Your brain and body tell these muscles what to do without you even thinking about it. You can't use your smooth muscles to make a muscle in your arm or jump into the air.

But smooth muscles are at work all over your body. In your stomach and digestive system, they contract (tighten up) and relax to allow food to make its journey through the body. Smooth muscles are also found in your bladder. When they're relaxed, they allow you to hold in urine until you can get to the bathroom. Then they contract so that you can push the urine out. These muscles are also in a woman's uterus, which is where a baby develops. There they help to push the baby out of the mother's body when it's time to be born.

You'll find smooth muscles at work behind the scenes in your eyes, too. These muscles keep the eyes focused.

Skeletal Muscle

Now, let's talk about the kind of muscle you think of when we say "muscle" — the ones that show how strong you are and let you kick a soccer ball into the goal. These are your skeletal muscles — sometimes called **striated** (say: **stry**-ay-tud) **muscle** because the light and dark parts of the muscle fibers make them look striped (striated is a fancy word meaning striped).

Skeletal muscles are voluntary muscles, which means you can control what they do. Your leg won't bend to kick the soccer ball unless you want it to. These muscles help to make up the **musculoskeletal** (say: mus-kyuh-low-**skel**-uh-tul) **system** — the combination of your muscles and your skeleton, or bones.

Together, the skeletal muscles work with your bones to give your body power and strength. In most cases, a skeletal muscle is attached to one end of a bone. It stretches all the way across a joint (the place where two bones meet) and then attaches again to another bone.

Skeletal muscles are held to the bones with the help of **tendons** (say: **ten**-dunz). Tendons are cords made of tough tissue, and they work as special connector pieces between bone and muscle. The tendons are attached so well that when you contract one of your muscles, the tendon and bone move along with it.

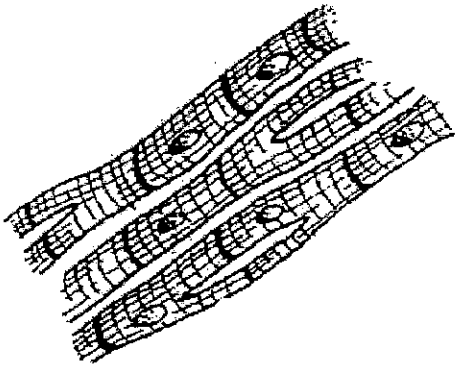
Skeletal muscles come in many different sizes and shapes to allow them to do many types of jobs. Some of your biggest and most powerful muscles are in your back, near your spine. These muscles help keep you upright and standing tall.

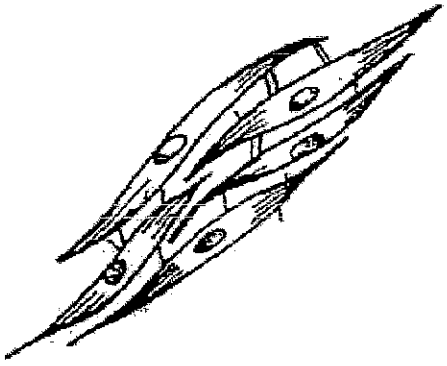
They also give your body the power it needs to lift and push things. Muscles in your neck and the top part of your back aren't as large, but they are capable of some pretty amazing things: Try rotating your head around, back and forth, and up and down to feel the power of the muscles in your neck. These muscles also hold your head high.

Muscle Types Picture Notes - 6th Grade Health

category

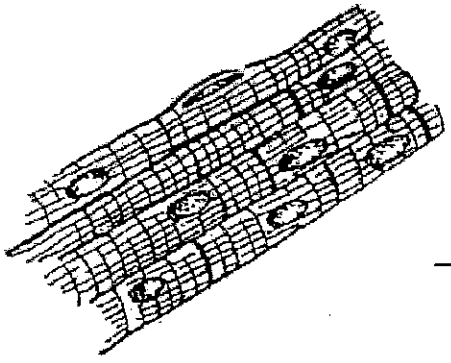
Involuntary





category

Voluntary



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Muscle Types Worksheet- 6th Grade Health

In the space provided write: **cardiac, smooth** or **skeletal.**

_____ 1. These muscles control breathing and digestion.

_____ 2. These muscles never tire.

_____ 3. These muscles move bones.

_____ 4. These muscles are found only in the heart.

_____ 5. These muscles control voluntary movements.

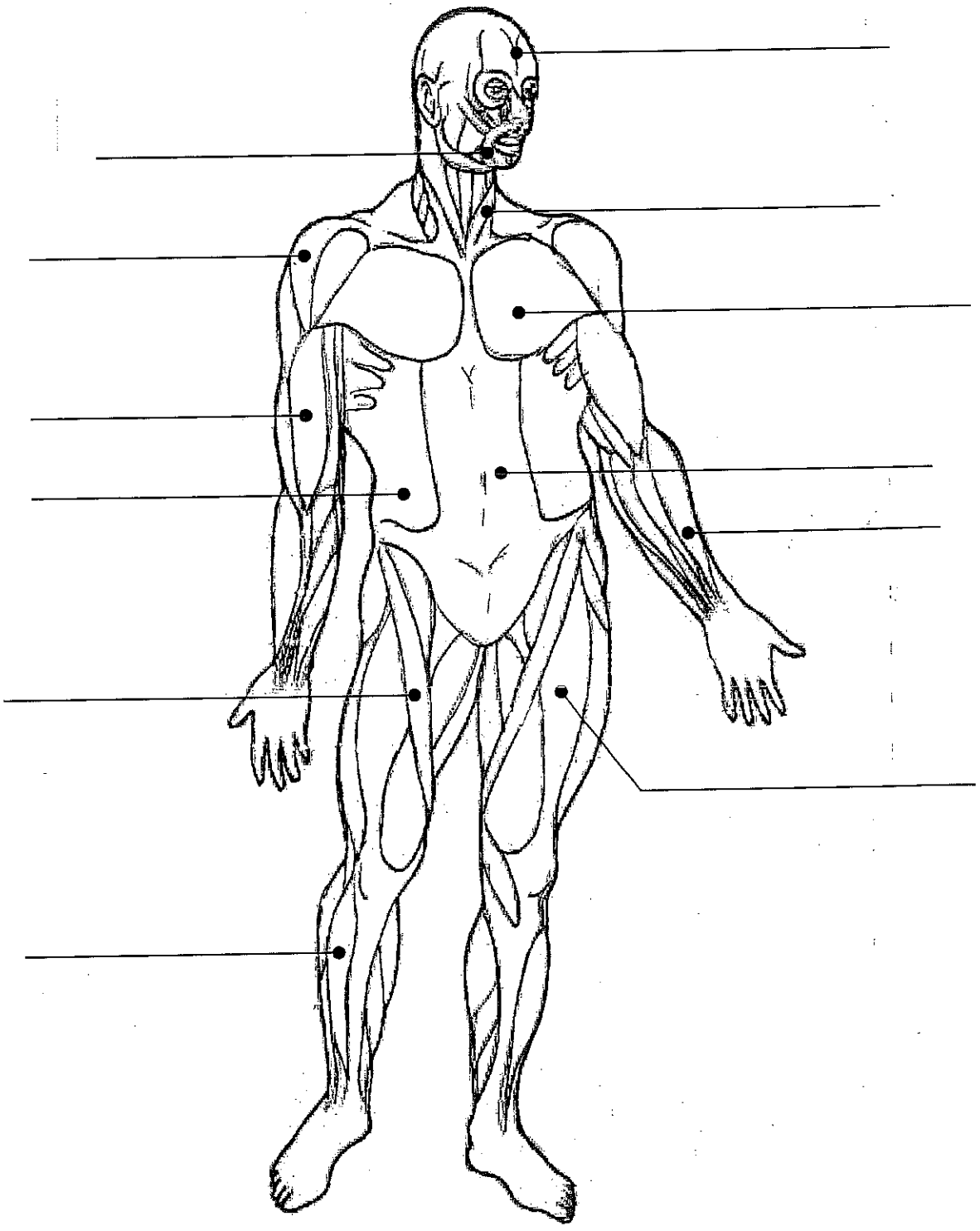
_____ 6. These muscles react slowly and tire slowly.

_____ 7. These muscles react quickly and tire quickly.

_____ 8. These muscles are striated.

/8

Specific Muscles - Front



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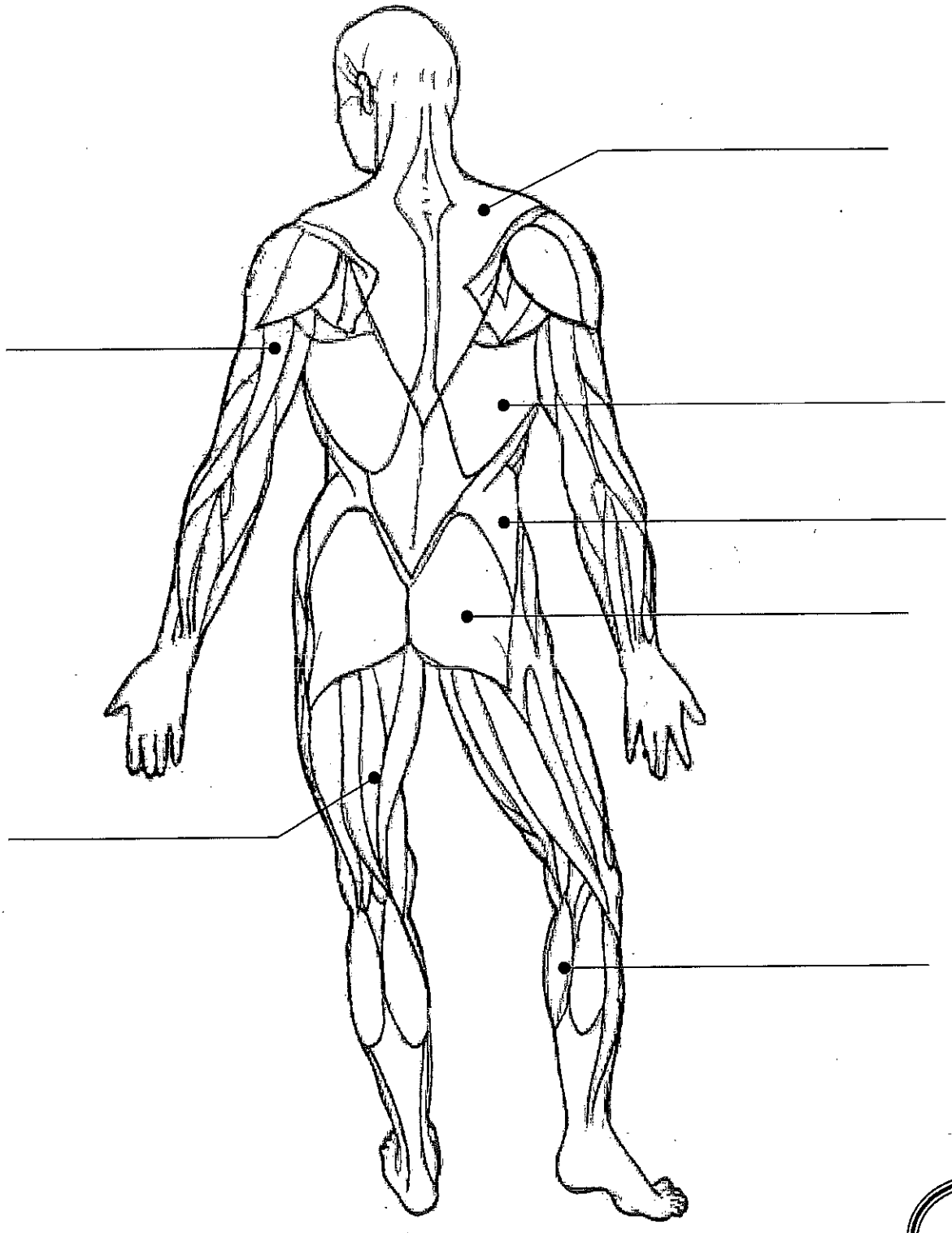
Specific Muscles - Back



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Muscle System Word Search - 6th Grade Health

Highlight or circle the answers to the questions in the word search.

1. This muscle is located on the front of the upper arm (helps to bend). _____
2. This muscle is located on the back of the upper leg (helps to bend). _____
3. This muscle is the top of your shoulder. _____
4. This muscle is found on your forehead. _____
5. Your "calf" muscle is also called _____.
6. The powerful muscle in your "butt" is the _____ maximus.
7. This muscle allows your jaw to open. _____
8. The muscles on the side of your torso are the external _____.
9. The largest chest muscles are the _____ major.
10. This muscle is located on the front of your upper leg (help to extend. _____
11. This muscle runs from the outside of your hip to the inside of your knee. _____
12. This muscle is the large muscle of the upper back. _____
13. These muscles are found in the back of your upper arm. _____

B	O	H	R	S	N	S	E	C	A	X	P	G	E	U
D	I	P	E	C	T	O	R	A	L	I	S	A	N	T
R	E	C	T	U	S	F	E	M	O	R	I	S	R	M
E	T	R	E	M	T	S	P	E	C	I	R	T	T	J
C	B	D	S	P	S	I	L	A	T	N	O	R	F	M
N	O	Q	S	S	S	S	N	P	D	W	T	O	L	H
R	H	D	A	J	A	F	H	C	X	W	R	C	K	P
S	M	I	M	O	R	I	E	G	S	C	A	N	G	R
Z	R	O	R	N	T	E	B	M	I	E	P	E	F	I
S	S	T	L	I	O	S	P	W	O	T	E	M	E	L
R	P	L	P	L	R	N	R	I	S	R	Z	I	T	G
P	S	E	U	Q	I	L	B	O	E	N	I	U	E	S
I	M	D	C	S	U	E	T	U	L	G	U	S	L	N
S	O	B	Q	I	S	X	E	T	T	S	S	R	Q	S
R	D	E	A	R	B	H	S	M	R	C	N	O	C	P

Pectoralis
Masseter
Biceps
Triceps
Rectus Femoris
Obliques
Sartorius
Gluteus
Deltoid
Frontalis
Trapezius
Gastrocnemius
Biceps Femoris

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HOW MUSCLES WORK – 6th Grade Health

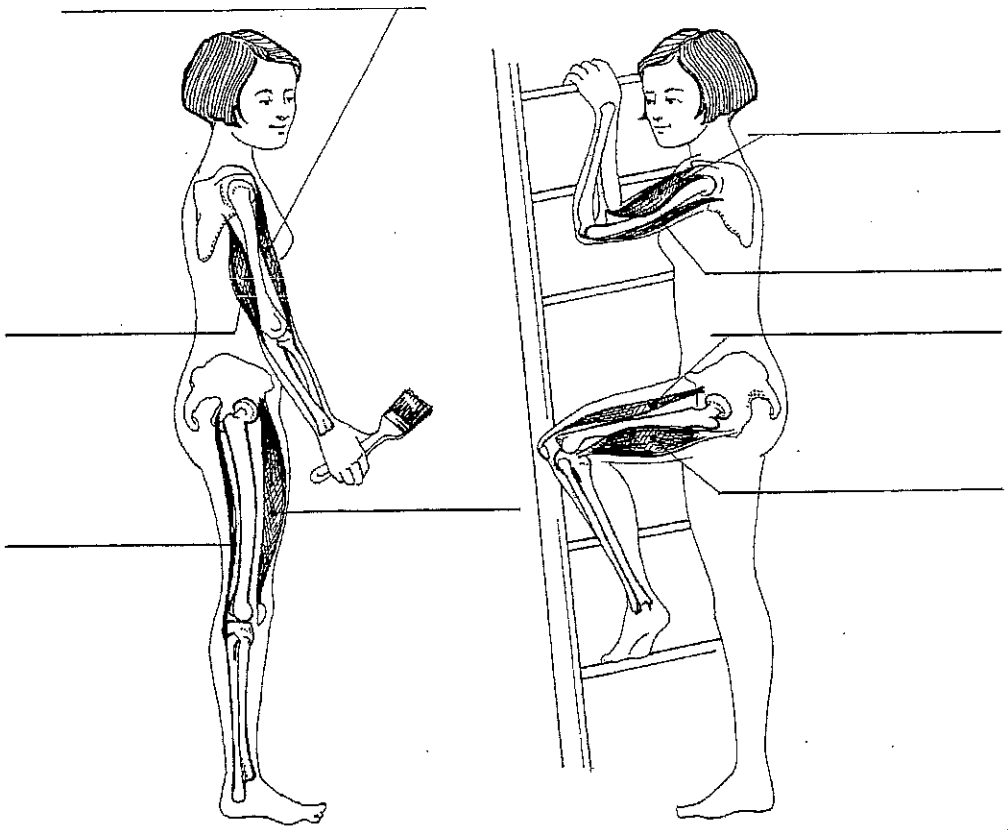
Muscles are responsible for your body's every movement. Muscles are more than movers. Muscles also make the heat that keeps your body warm. If you leap, bend, or reach, it is a result of a muscle action. A muscle makes itself smaller when it contracts and longer when it relaxes.

Muscles produce movement by pulling against the bone. Even when you push against a wall, the muscles in your body are working by pulling. When the muscles relax they stop pulling. More than one muscle works each joint, and they pull in opposite directions.

Working in pairs

Muscles that move your bones work in pairs. As one muscle contracts and gets shorter, another relaxes and returns to normal length. When you flex your bicep, the tricep muscle relaxes. When you straighten your arm back out, your tricep muscle contracts (pulls against your arm bone) and the bicep muscle relaxes.

Muscles are working all the time to help you keep your balance, and to move your head, back, arms, legs, and other parts. Even the smooth muscles in your digestive system work against each other. While one muscle squeezes the tubes involved in digestion, another straightens them out again.



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Word bank:

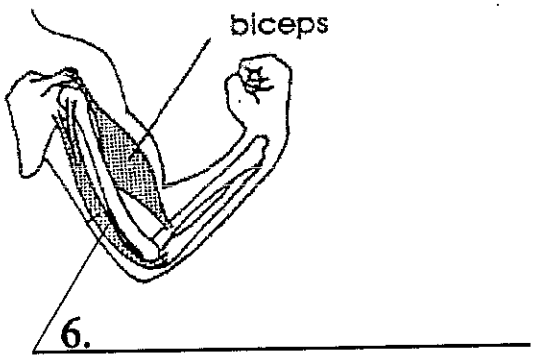
biceps relaxed **triceps relaxed** **quadriceps relaxed** **hamstrings relaxed**

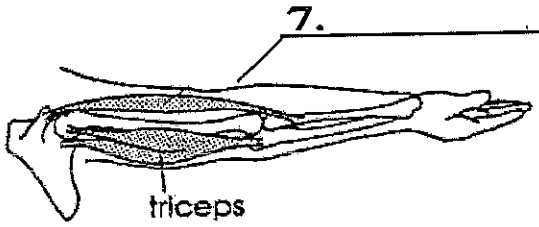
biceps contracted **triceps contracted** **quadriceps contracted** **hamstring contracted**

Mighty Machines - 6th Grade Health

_____ 1. contract	A. straightens a joint
_____ 2. relax	B. muscle gets longer
_____ 3. flexor	C. bends a joint
_____ 4. extensor	D. muscles work in …
_____ 5. pairs	E. muscle gets shorter

Fill in the missing muscle names and answer the questions.





When your arm is bent…

8. Which muscle is contracted? _____

9. Which muscle is longer? _____

/10

When your arm is straight…

10. Which muscle is relaxed? _____

Strains and Sprains Are a Pain- 6th Grade Health

If you're an active kid, you'll probably get a sprain or a strain at some point. Strains and sprains are common injuries, especially for kids who play hard or do sports. Let's find out more about them.

What Are Strains and Sprains?

Muscles contract and relax (almost like rubber bands) to help your body move. So a **strain** is exactly what it sounds like: a **muscle** that has been stretched too far. It's common for people to strain the muscles in their backs, necks, or legs.

Bones meet at joints, such as elbows, knees, or shoulders. That's where your body bends and rotates. Strong, elastic bands of tissue, called **ligaments** (say: **lih**-guh-muntz), hold bones to bones together at the joints. A **sprain** happens when the **ligaments** have been overstretched (mild sprain) or torn (severe sprain). Ankles, wrists, and knees sprain easily.

How Is a Strain Different From a Sprain?

Even though both can hurt a lot, strains are not as serious as sprains. Strains occur in the muscles. Because they occur in the muscle, it may start to hurt immediately or several hours later. The area will be tender and swollen and may also appear bruised.

A sprain will probably start to hurt right away. Usually the injury will swell and look bruised, it may be hard to walk or move the injured part, and you may even think you have broken a bone. There are three levels of sprains: Grade 1- an overstretched ligament; Grade 2- a partial tear; Grade 3- full tear.

How Does a Strain or Sprain Happen?

Strains often happen when you put a lot of pressure on a muscle or you push it too far, such as when lifting a heavy object. Strains may be more likely to happen if you haven't warmed up first to allow blood to circulate to the muscles. They're also common for someone returning to a sport after the off-season.

Sprains are caused by injuries, such as twisting your ankle. This kind of injury is common in sports, but can also happen any time you trip or fall. Someone could sprain there ankle when they were running up the stairs or getting out of their car!

If You Get a Strain or Sprain

Stop! That's the word to remember if you get a strain or sprain. Your brain is telling you something. Don't use the part of your body that's hurt. That means no walking on a hurt ankle or using a hurt arm. Tell a grown-up right away so he or she can get you to a doctor, if necessary.

It can be hard to tell the difference between a sprain and a broken bone, so it's often a good idea to see a doctor. In some cases, you might need to go to the emergency room.

What Will the Doctor Do?

He or she may gently touch the area, check the color, feel if your skin is warm or cold, and look for swelling and tenderness. If you hurt your ankle, your doctor might ask to see if you can stand on it. In some cases, the doctor will order an X-ray to tell if the bone is broken.

If you have a sprain, the doctor will probably have you wear a splint or temporary cast to support and protect the injured area. He or she may wrap the injury with an elastic bandage to reduce swelling and provide extra support.

If you have a strain, the doctor will probably tell you to rest the injury and maybe take some pain medication.

What Should You Do Now?

It's very important to follow your doctor's instructions. When you get home, remember **RICE**. RICE is a way to remember how to take care of your injury. It stands for **R**est, **I**ce, **C**ompression, and **E**levation.

REST the injured part of the body.

Apply **ICE** or cold packs to the injury. This helps bring down swelling, so the injured area will be less puffy.

Wear an elastic **COMPRESSION** (say: kum-**preh**-shun) bandage or splint. Compression means to apply or press something together. When an injury is wrapped firmly, the pressure prevents and decreases swelling (puffiness).

ELEVATION means raising the injured part so it's higher than your heart. You can use pillows to raise it up. This also prevents swelling.

After 24 hours, it's OK to use warm compresses or a heating pad to soothe aching muscles. Take any pain medications that have been ordered by your doctor.

A strain takes about 1 week to heal. A bad sprain may take longer — as long as 3 to 4 weeks to heal or sometimes even longer. While your strain or sprain heals, take it easy and don't do stuff that could cause another injury.

Sprains and Strains Review - 6th Grade Health

1. What is a sprain? _____

2. What is a strain? _____

3. Explain the differences between the two injuries:

_____

_____

_____

_____

4. Explain the 3 levels of a sprain:

_____

_____

_____

5. How does a strain occur?

_____

6. How does a sprain occur?

_____

What will the doctor do if you have a sprain?

_____

8. What will the doctor do if you have a strain?

_____

9. Please explain the RICE formula:

R _____ : _____

I _____ : _____

C _____ : _____

E _____ : _____

/20

Name _____ Mrs. D'Angelo Section _____

Muscular System Lab - 6th Grade

In your small group you will visit each station. Follow the directions on your activity sheet. Answer the questions about each station as you complete each task.

I. Wall sit

Sit against the wall as shown in the picture. Be sure your legs are at a right angle to the wall and your back is flat against the wall. Have one person time you to see how long you can hold the correct position. Record your time in the "Trial 1" box. Immediately try again and place your second time in the box labeled "Trial 2".

Trail 1:	Trail 2:

What did you observe about your time from trial 1 to trial 2?

_____

Which muscle group(s) is/are being tested?

_____

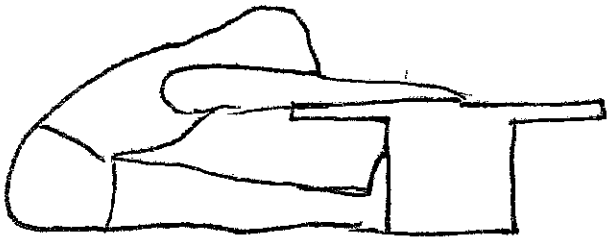
II. Clothespin squeeze

Hold the clothespin in one hand. Have one person keep time. Open and close the clothespin as many times as you can in one minute. Record the number of times under "Trial 1". Immediately do the activity again. Record the number of times you open and closed the clothespin in the second minute and record the number in the "Trial 2" box..

Trail 1:	Trail 2:

Were you able to open the clothespin more or less the second minute? Why?

_____

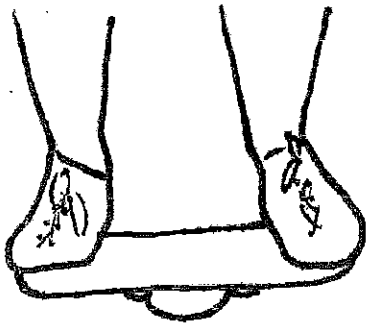


III. Sit and Reach

Take off your shoes. Place your feet in the box. Put both hands next to each other and push the metal measure as far as you can. Record your distance in centimeters in the "Trial 1" box and then repeat the activity and place your second score in the "Trial 2" box.

Trial 1:	Trial 2:

What muscles are being tested for flexibility? _____

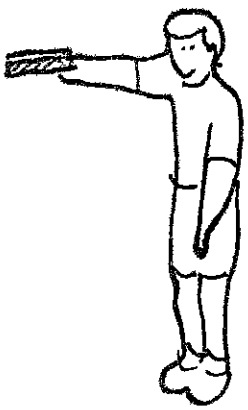


IV. Balance Board

Select someone to be the timer. Put one foot on the board. As soon as you place the second foot on the board and both ends are off the ground, the timer will start the stopwatch. See how long you can keep the board from touching the ground. Record your time under "Trial 1". Try again and record your time under "Trial 2".

Trial 1:	Trial 2:

What factors do you think influence your balance? _____



V. Book Hold

Hold a textbook straight out in front of you (at shoulder height) with your elbow locked out. One person should be the timer and should time how long you can hold the book parallel to the floor, even with your shoulder, and without bending your elbow. Do this activity two times (with as little break as possible), placing the first score in the "Trial 1" box and the second score in the "Trial 2" box.

Trial 1:	Trial 2:

What muscles tire the most in this activity? _____