Shapes and Sizes of Muscles

By Jennifer Kenny

[1] 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. This is very subjective, meaning, it is based on a system by the way you like to group them. Scientists and physicians do the same thing with muscles.

[2] **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.

[3] **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. Therefore, some scientists like to group the muscles based on this information.

[4] **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.

[5] **Large and small:**
Muscles can also be grouped by shape, size, or position. For example, the muscles in the buttocks 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?

[6] **Muscle fibers:**
Finally, some scientists classify muscles according to the arrangement of muscle fibers within a muscle. Strap, fusiform, pennate, and circular are examples of main groupings in this form of classification. Strap muscles are not strong, but they do have a wide range of movement. Strap muscles have fibers that run parallel to the tendon. A strap muscle moves the hyoid bone in the throat to allow for swallowing and speaking. The biceps muscle is an example of a fusiform, or parallel, muscle. It raises the upper arm. A fusiform muscle is thick in the middle and tapered at the edges. Its fibers run parallel to the tendon where it is attached. Pennate muscles have a tendon at each end. At one of those ends, they are attached by fascicles (or bundles of muscle fibers). The thumb is bent by a unipennate muscle. That means all the muscle fibers are on the same side of the tendon. The knee is bent by a bipennate muscle. That means the pennate muscle has fibers on both sides. The deltoid muscle, which allows the arm to be raised outward, is a multipennate muscle. That means the tendon branches within it. Circular muscles have bundles of muscle fibers arranged in rings around an opening. They control the size of an opening such as the iris of the eye, the anus, or lip movement.

[7] 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?

Name _____ Science Pd: _____

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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) Smooth (B) Cardiac (C) Skeletal
3. A muscle is called a(n) _____ if it straightens part of your body. (A) Extensor (B) Flexor	4. Strap muscles are very strong. (A) False (B) True
5. The biceps muscle is an example of a _____ muscle. (A) Fusiform (B) Strap (C) Pennate	6. Which is **not** controlled by a circular muscle? (A) Lip movement (B) Upper arm movement (C) Iris of the eye (D) Anus opening
7. The muscles in the buttocks are small. (A) False (B) True	