

What Kind of Joint Is This?

The last part of the skeletal system is the joints. A **joint** is a place where two bones meet, or where a bone and cartilage meet. There are more than 200 bones in a human skeleton, so there are a lot of places where the bones meet. Bones have three different jobs to do. Bones must give shape and support to the body, provide protection, and work with the muscular system to help the body move. Joints can help with these jobs, especially the last one.

There are five different kinds of joints in the body. The first kind of joint is called a **fixed joint**. When the bones meet at a fixed joint, there is almost no movement. The bones are very close to each other and they stay that way. The skull is a good example of bones meeting at fixed joints. The fixed joints in your skull help protect your brain.

A second kind of joint is called a **gliding joint**. Your wrists have gliding joints. You can move your wrists back and forth. You can also move them from side to side. Try moving your back from side to side. You also have gliding joints in your backbone or spine, too.

You are able to rotate your head almost all the way around your body. You can do that because of **pivoting joints** in your neck. You can also pivot your lower arms because of the joints between those two bones.

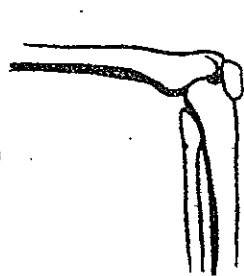
The fourth kind of joint is called a **hinge joint**. Hinge joints allow movement back and forth, like the opening and closing of a door. Your elbows and knees are good examples of hinge joints.

Finally, a **ball-and-socket joint** allows a lot of movement. Try to make a big circle with your arm. The ball-and-socket joint in your shoulder lets you do that. Can you make a circle with your leg? You can do this because of the ball-and-socket joint at your hip.

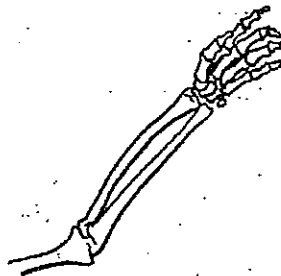
KINDS OF JOINTS



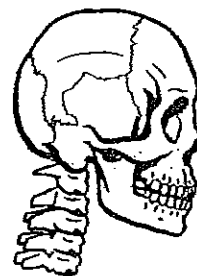
Ball and Socket
(hips and arms)



Hinge Joint
(elbows, knees)



Pivot Joint
(head, arms)



Fixed Joint
(skull)



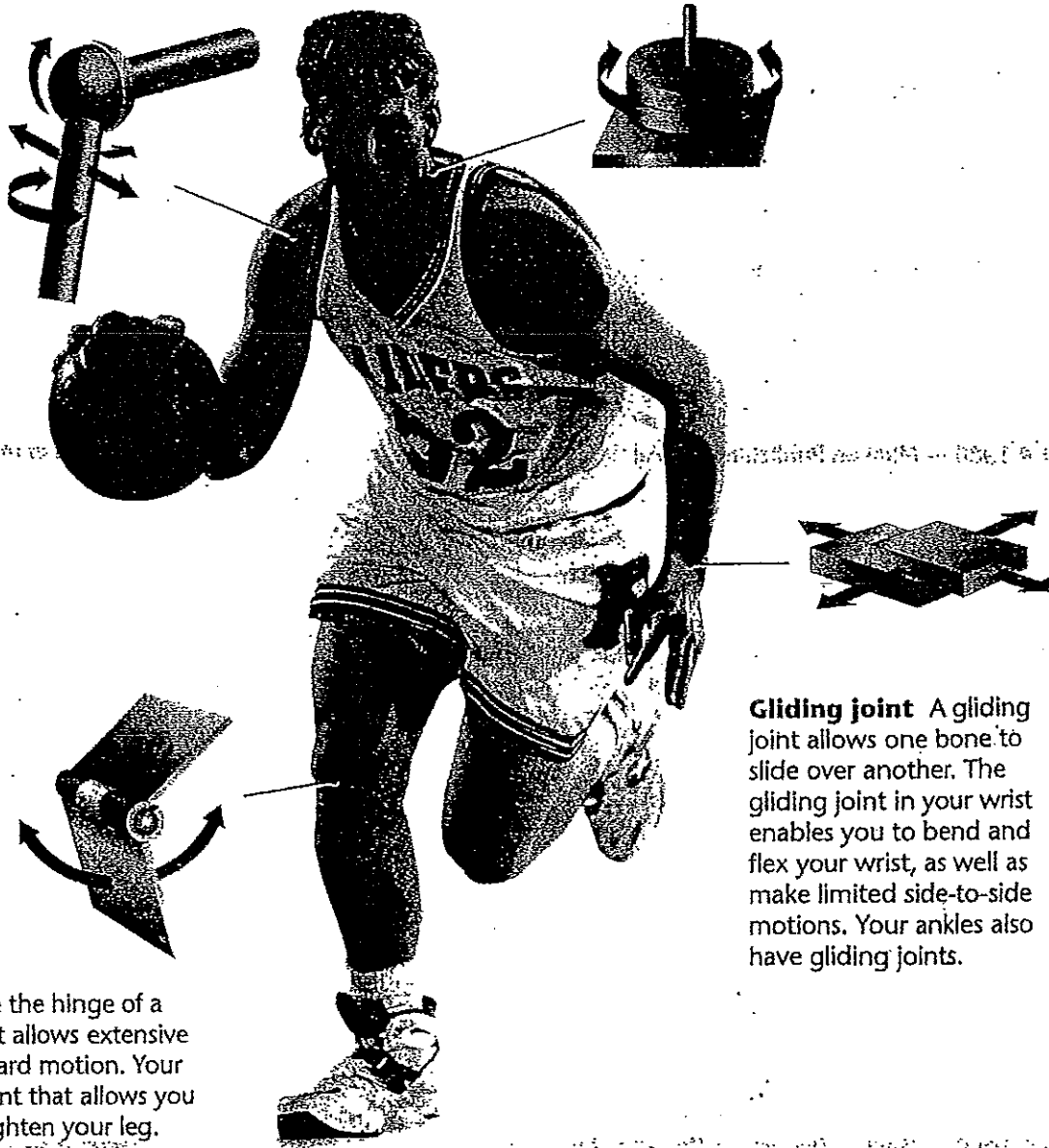
Gliding Joint
(wrist, spine)

EXPLORING Movable Joints

Without movable joints, your body would be as stiff as a board. The four types of movable joints shown here allow your body to move in a variety of ways.

Ball-and-socket joint Ball-and-socket joints allow the greatest range of motion. In your shoulder, the top of the arm bone fits into the deep, bowl-like socket of the scapula (shoulder blade). The joint allows you to swing your arm freely in a circle. Your hips also have ball-and-socket joints.

Pivot joint A pivot joint allows one bone to rotate around another. The pivot joint in the top of your neck gives you limited ability to turn your head from side to side.



Hinge joint Like the hinge of a door, a hinge joint allows extensive forward or backward motion. Your knee is a hinge joint that allows you to bend and straighten your leg. Your elbow is also a hinge joint.

Gliding joint A gliding joint allows one bone to slide over another. The gliding joint in your wrist enables you to bend and flex your wrist, as well as make limited side-to-side motions. Your ankles also have gliding joints.

What's the Connection Here?

You have learned that the skeletal system has three major jobs. It shapes and supports the body; protects organs inside the body; and works with the muscular system to help the body move. The skeletal system also has two minor jobs to do. It makes red blood cells and stores fat cells.

The skeletal system has four basic parts: the bones, the ligaments, the cartilage, and the joints. You have learned about bones, what they are made of, how many there are in the adult body, how they are put together, how they are classified, and how they help the skeletal system do its jobs. Now, it is time to learn about ligaments and cartilage.

What is a **ligament**? A ligament is a kind of **connective tissue**. As you might guess from the word, connective tissue joins parts of the body together. Ligaments are the connective tissue that connects bones to other bones. Ligaments are tough tissue, and they are stretchy to allow bones to move. However, if you stretch a ligament too much, it can be pulled or torn. That can be very painful!

What is **cartilage**? Cartilage is another kind of tissue. It is tough like ligaments are, but it is not as stretchy. Cartilage is flexible tissue.

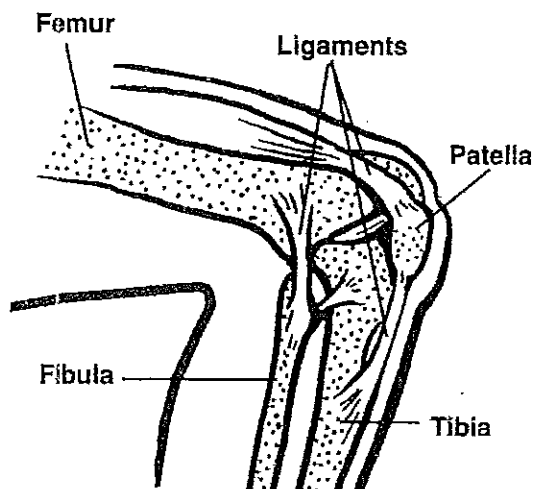
Cartilage can be found in many places in the body. First, cartilage is found around the ends of many bones. It is also between some of the bones at the joints where they meet. Cartilage is also found at the end of the nose and the tops of the ears.

Cartilage has three jobs. The first job is to protect bones. Cartilage acts like a shock absorber. Some cartilage is like a cushion put between the ends of bones where they meet at joints. Other cartilage is wrapped around the ends of bones.

Try a little experiment while you are sitting at your desk. Make fists with both of your hands. Imagine that your fists are the ends of your leg bones where they meet at your knees. Bounce your fists against each other several times. Imagine that you are jumping onto the ground. When you bounce your fists together this way, it might not feel very good. You would never want to jump if your legs hurt every time you tried it. Now, use two thick, soft towels or shirts. Wrap them around your hands and then bounce your fists against each other. This time it should feel better. The towels are like the cartilage that is on the ends of your bones. It protects the bones and absorbs the shocks when you move.

The second job of cartilage is to give shape to your body. The cartilage at the end of your nose and in your ears does that for you. Look around the room. Does everyone have the same shaped nose? Of course not, the cartilage is a little bit different for every person. That's what helps make our faces so interesting!

Finally, the cartilage in our skeletal system is to give us some flexibility. Try moving the top part of your nose, up near your eyes. You can't do it, can you? That part of your nose is solid bone. Now, try moving the tip of your nose. You can move that easily! That is the flexible cartilage that you are moving!



Name: _____ Date: _____

Questions

1. What is a ligament?

2. Why is it important for ligaments to be stretchy?

3. What is cartilage?

4. What are three places that cartilage can be found?

5. Why is it important to have cartilage around the ends of bones?

6. You have cartilage between the bones in your spine. Why is that an important place to have cartilage?

7. What are the three jobs of cartilage?

Vocabulary Review

Write a good definition for each of the following words.

1. Cartilage: _____

2. Connective tissue: _____

3. Ligament: _____

Name: _____ Date: _____

Questions

1. What is a joint?

2. What are the five kinds of joints?

3. What is an example of each kind of joint?

4. Which type of joint helps the skeletal system protect organs inside the body? Why?

5. Which kinds of joint help the body move? How?

6. Your pelvis is actually a group of bones held together. There is not much movement at the joints in your pelvis. What kind of joints do you think they are?

7. When babies are born, they have a soft spot on the top of their head. This area allows the baby's head to fit through the mother's birth canal better. As the baby gets older, the soft spot closes up and the skull becomes more solid. Why is it important not to let a baby be hit on the head at the soft spot?
