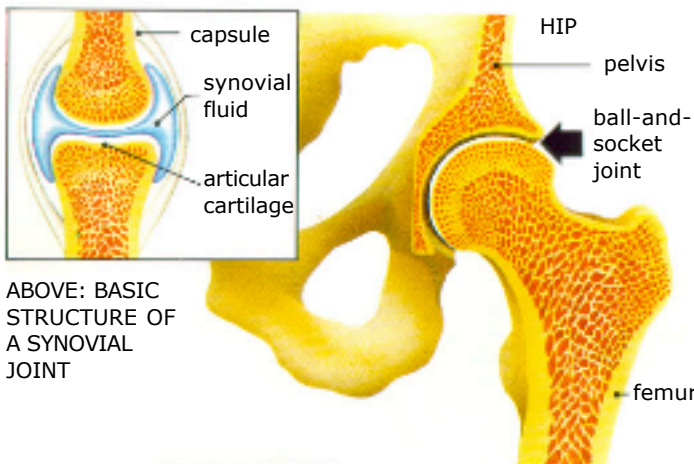
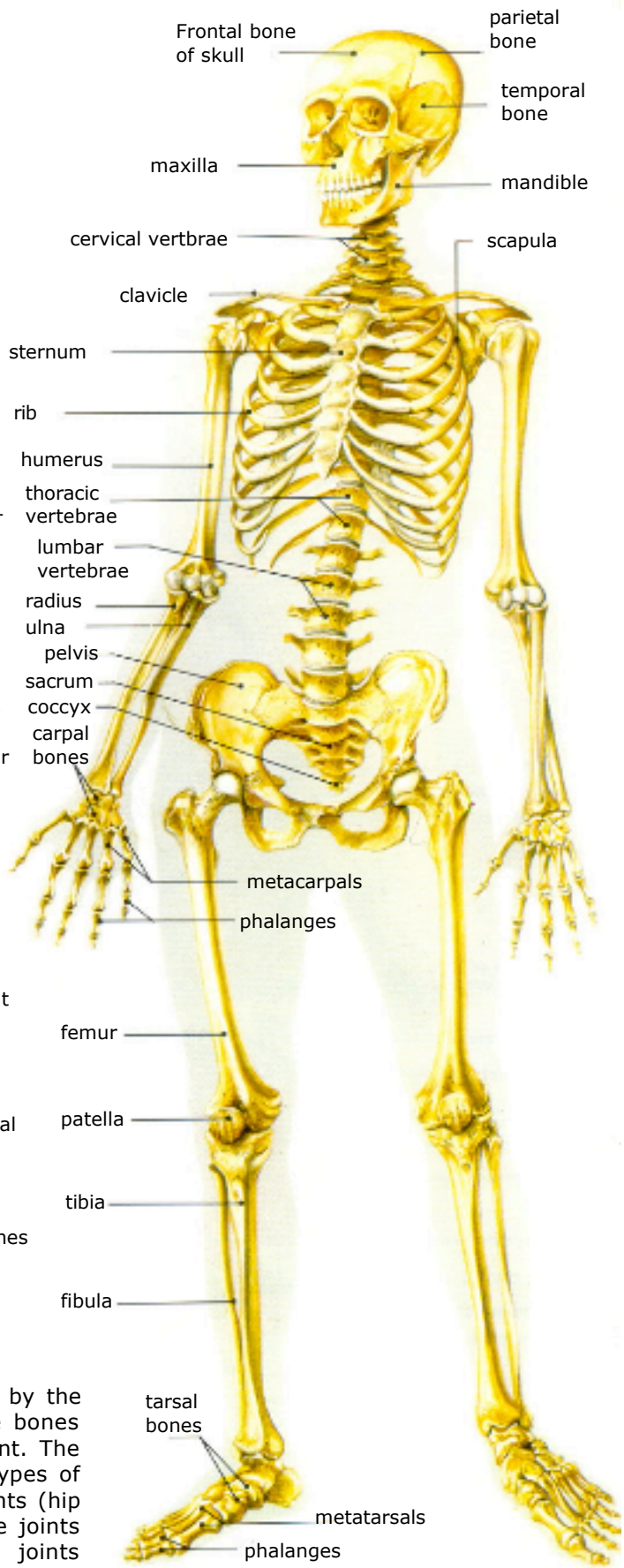
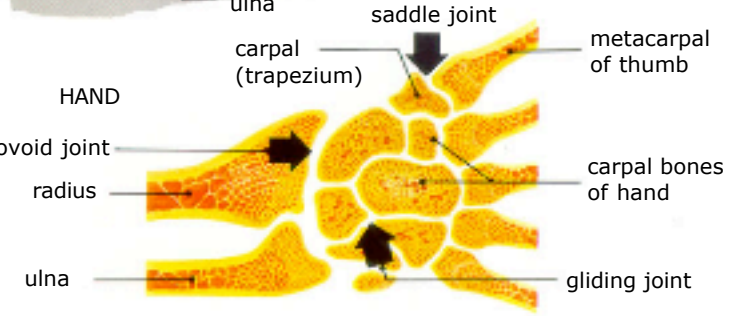
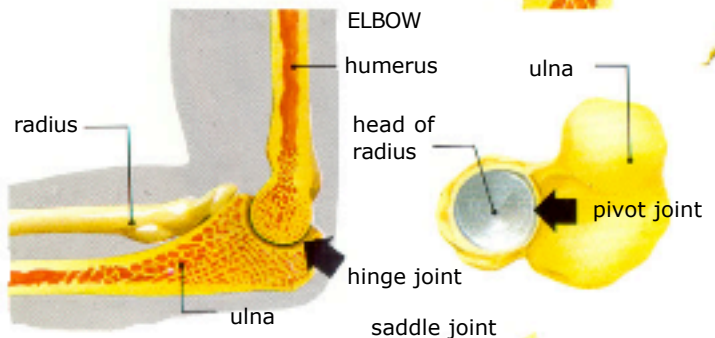


The Bones and Joints 1

The skeleton gives us form, support and protection. There are about 206 bones, supplemented by pieces of cartilage. The bones (especially long bones and limbs) act as levers operated by the muscles; hence we can move. Some bones (including the ribs and skull) serve to protect the organs they enclose. Bones consist of vital minerals and some contain marrow; the site of blood cell formation. Joints between bones are of three types: fibrous (no movement), cartilaginous (limited movement) and synovial (freely movable).

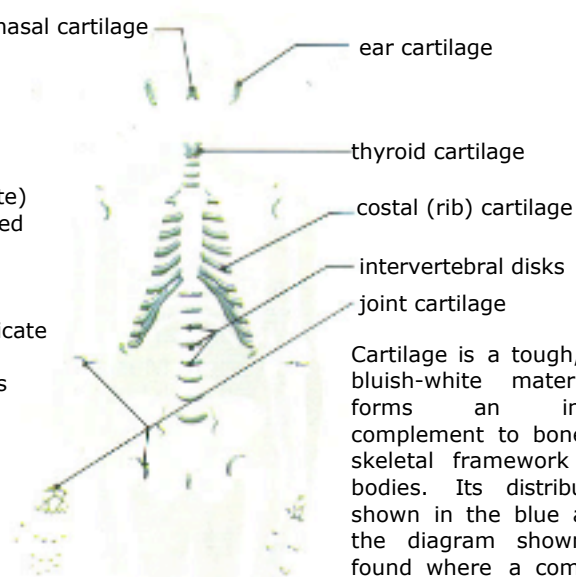
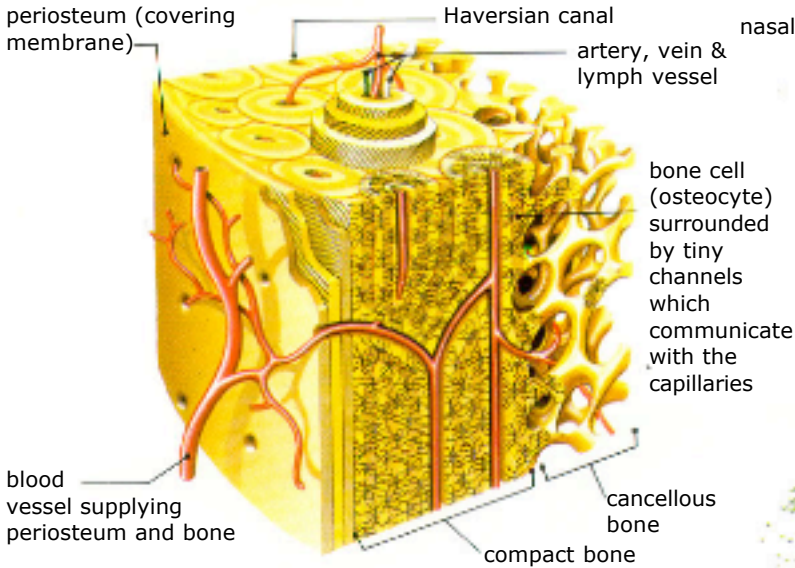


ABOVE: BASIC STRUCTURE OF A SYNOVIAL JOINT



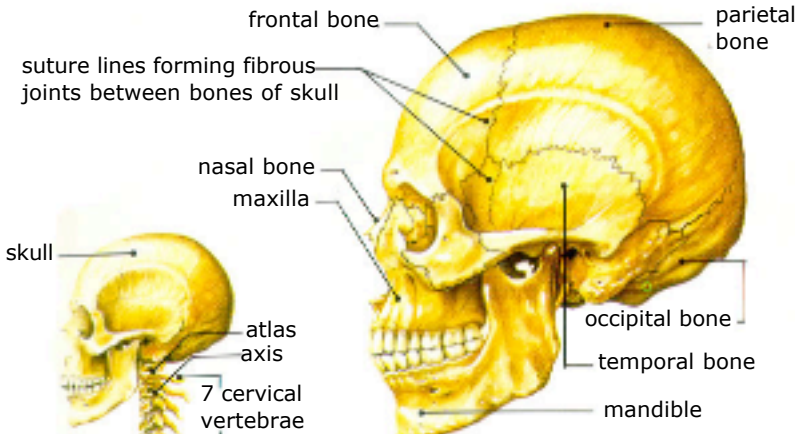
Free movement around synovial joints is permitted by the smooth 'articular cartilage' coating the ends of the bones and the lubricating 'synovial fluid' which fills the joint. The joint is enclosed by a fibrous capsule. Six different types of synovial joint are shown above. Ball-and-socket joints (hip and shoulder) allow a wide range of movement; hinge joints (elbow) allow movement in one plane only; pivot joints allow rotation; ovoid (or egg shaped) joints (wrist) and saddle joints (thumb) allow both side-to-side and back-and-forth motion, and gliding joints (carpals of the hand) permit similar but more restricted movements.

The Bones and Joints 2

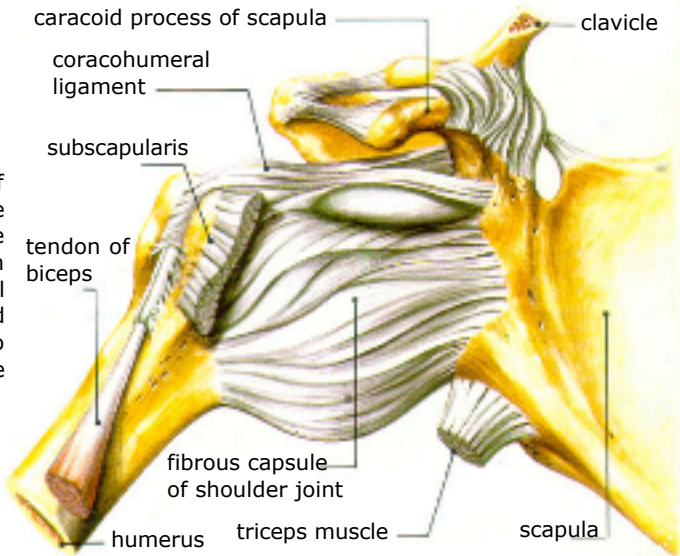
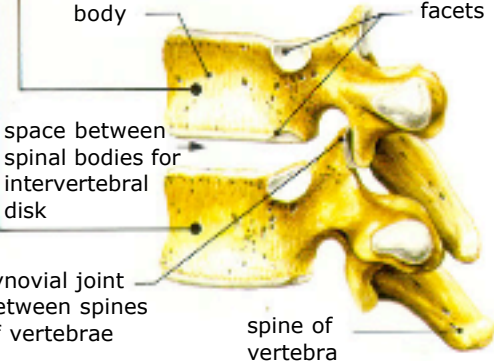
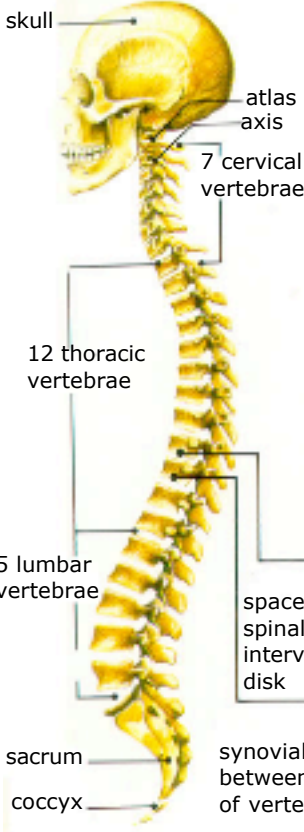


Cartilage is a tough, elastic, bluish-white material and forms an important complement to bone in the skeletal framework of our bodies. Its distribution is shown in the blue areas of the diagram shown. It is found where a combination of strength and flexibility is required: the cartilage of the nose, ears and larynx makes these structures tough and resilient. These qualities are also important in the intervertebral disks, which need to be flexible under pressure. Cartilage is also found covering synovial joints to help in movement. Cartilage has no blood supply and because of this any injury it sustains is slow and limited to repair.

The bones detailed structure yields a combination of strength, light weight and some flexibility. Around 65% of bone weight is made up of minerals (mostly calcium and magnesium). The centre of long bones contain a cylindrical cavity filled with bone marrow.



When growing is complete, the bones of the skull fuse together; the joints (suture lines) contain connective tissue and are fibrous joints. Pads of cartilage form cartilaginous joints between the spinal vertebrae. Each disk allows only limited movement but this adds up to considerable flexibility over the entire length of the spine.



The Shoulder is the most mobile joint in the body. The scapula is only attached to the main skeleton through the clavicle. This makes it relatively weak and unstable, but the shoulder is enclosed by a capsule of fibrous ligaments and held together by a number of muscles. The shoulder can however become dislocated easily if forced in a downward direction, as there is no supporting muscles underneath the joint.