Biology: 8. The Skeleton and Movement

Please remember to photocopy 4 pages onto one sheet by going A3→A4 and using back to back on the photocopier

Syllabus

OB24 Identify the main parts of the human skeleton and understand that the functions are support, movement and protection

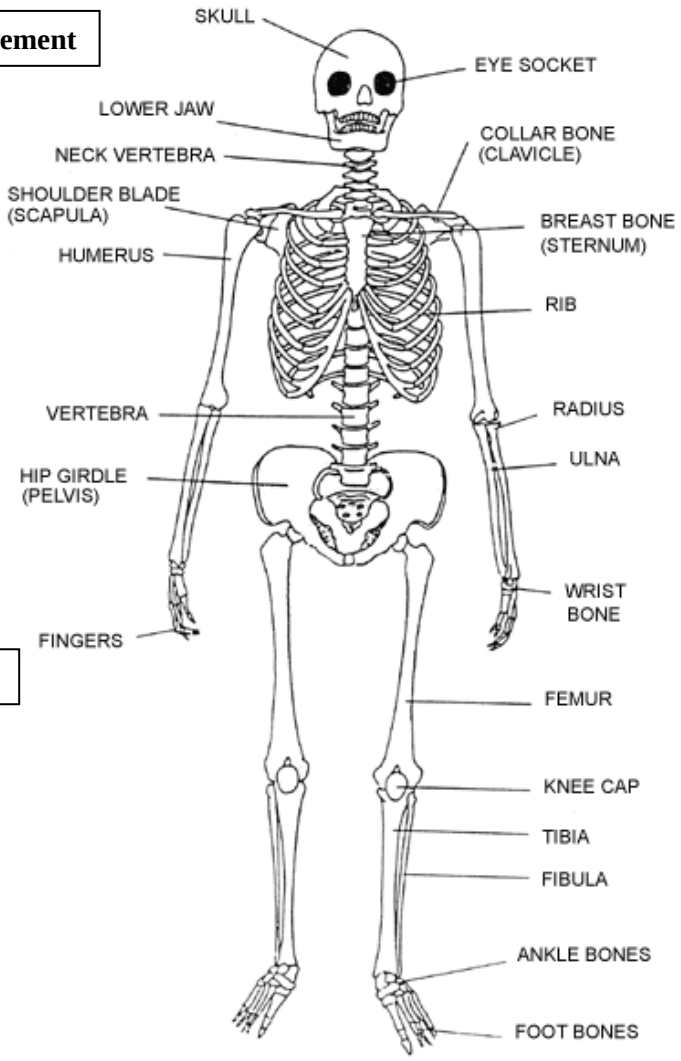
OB25 Locate the major bones in the human body including the skull, ribs, vertebrae, collarbone, shoulder blade, humerus, radius, ulna, pelvis, femur, tibia and fibula, using a diagram or a model skeleton

OB26 Understand the function of joints and muscles (including antagonistic pairs), tendons and ligaments, and the relationship between these and bones

OB27 Describe the general structure and action of different types of joints: fused, ball and socket and hinged, and identify examples of each: skull, shoulder, elbow, hip, knee

Student Notes

The functions of the skeleton are support, protection and movement



Support

Our skeleton supports our body and maintains its shape.

Protection

It also protects our soft organs; the skull protects the brain, the backbone protects the spinal cord, the ribcage protects heart and lungs etc.

Movement

Our skeleton also enables us to move with the help of muscles.

Muscles and Joints

The function of muscles and joints is to allow movement

Muscles

Bones are moved by contraction of muscles.

Antagonistic pairs of muscles

Usually another muscle is used to return a bone to its original position. For this reason, muscles normally occur in pairs that exert opposite forces called **antagonistic pairs**.

Antagonistic muscles are muscles working in pairs in opposite directions controlling the movement of a joint e.g. biceps and triceps.

Joints

A joint is the place where two bones move against each other.

Types of joints

1. **Fused** has no movement e.g. skull
2. **Ball and Socket** allows movements in all directions, e.g. hips, shoulder
3. **Hinge** can bend in one direction only, e.g. knee, elbow

Tendons and Ligaments

A tendon joins a muscle to a bone (it has little elasticity and cannot be stretched)

A ligament joins bone to bone (it is elastic and can be stretched)

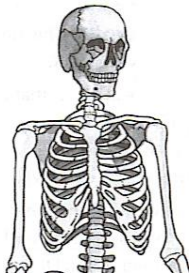
There **M**ust **B**e **L**ove **B**efore **B**abies
Tendons: **M**uscles to **B**one, **L**igaments: **B**one to **B**one

Synovial fluid lubricates the joint and allows the bones to move easily (it acts as a shock absorber).

Cartilage is soft skeletal tissue which covers and protects the ends of bones (it also acts as a shock absorber).

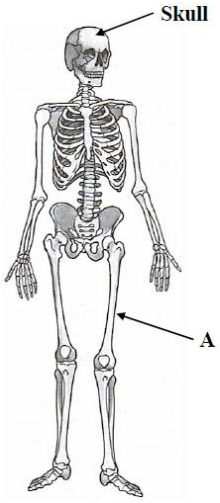
Exam Questions

1. [2009 OL][2008 OL]
   Give any two functions of the human skeleton.



2. [2011 OL]
   The human skeleton protects body organs.
(i) Name one organ protected by the ribcage.
(ii) Give one organ function of the skeleton.

3. [2006 OL]
   Name the bone of the human skeleton labelled A in the diagram on the right.



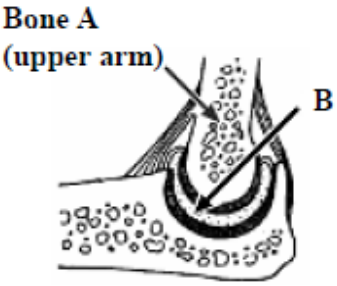
4. [2006 OL][2007 OL][2010][2008 OL]
   Name two organs that the human skull protects.

5. [2007 OL][2008 OL]
   Name an organ protected by the ribs.

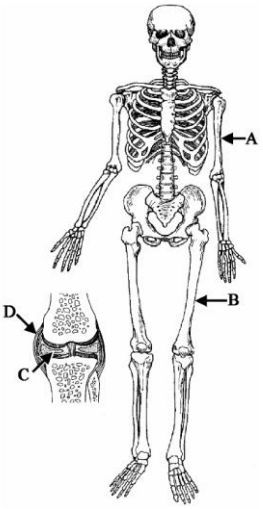
6. [2008 OL]
   What is the name of the organ which is protected by the pelvis?

7. [2007]
   Different types of joints hold together the bones of our skeleton.
(i) Name the type of joint labelled in the diagram of the human skull.
(ii) How does this type of joint differ from other types of joints found in our bodies?

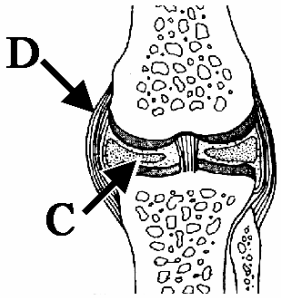
8. [2006]
   The diagram shows the structure of an elbow.
(i) Name bone A.
(ii) Identify the type of moveable joint B.



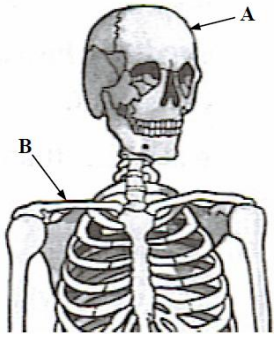
9. [2009]
   The diagram shows a detailed drawing of the structure of the knee joint. The kneecap is not shown.
(i) Name the bones labelled A and B.
(ii) What type of joint is the knee?



10. [2009]
    C is synovial fluid. D is a ligament.
(i) Give the functions of the parts labelled C and D in the knee.
(ii) Explain the action of antagonistic pairs of muscles in causing the movement of limbs.
    You may use a labelled diagram in your answer if you wish.



11. [2009 OL]
    Name the bones of the skeleton labelled A and B in the diagram.



12. [2007 OL]
    Complete the following sentences:
(i) The structure formed where two bones meet is called a _____.
(ii) The tissue that causes movement of joined bones is called _____.

Other Test Questions

1. List three different types of joint.

2. Write and finish the following sentence: Ligaments connect _____ to _____.

3. Write and finish the following sentence: Tendons connect _____ to _____.

4. Draw a labelled diagram of an arm showing the muscles, bones and joints.