Movement and support

Locomotion

One of the characteristic of living thing is movement.

Movement enable animals to look for food, mates and escape predators.

For movement to be possible there must be a form of support in animals it's the skeletal tissue.

The skeletons

There are three types of skeleton

(a) Hydrostatic skeleton

Here support is provided by a fluid under pressure and it is found in round worms, earthworm.

(b) Exoskeleton

It is made of a hard cuticle protecting inner delicate tissues and also provides attachment for muscles

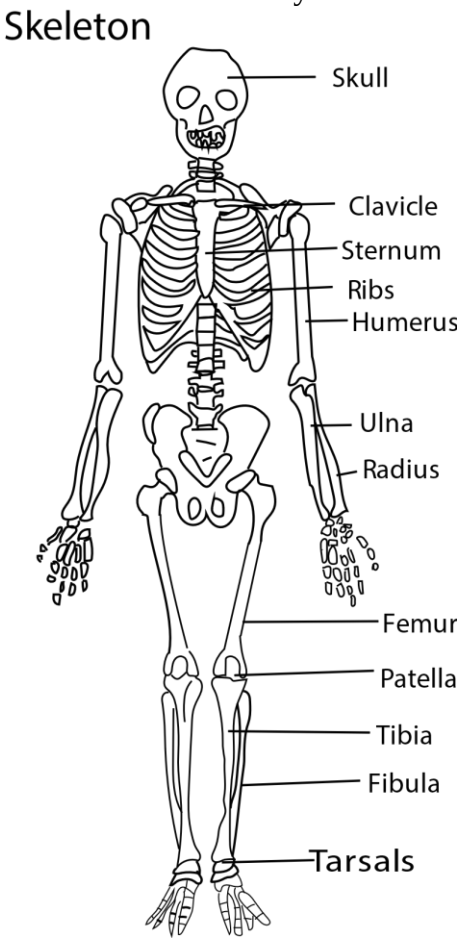
(c) Endoskeleton

It occurs in vertebrates, made of bone and cartilages.

It is internal and the muscles are outside

Skeleton

This is the framework of bone in the body



Human skeleton is divided into two parts

The **axial skeleton** forms the central axis of the body and includes the **bones** of the skull, vertebral column, and the thoracic cage

The **appendicular skeleton** is the portion of the skeleton of vertebrates consisting of the bones that support the appendages.

The appendicular skeleton includes the skeletal elements within the limbs, as well as supporting shoulder girdle pectoral and pelvic girdle.

BONES

Those are hard tissue that make up a skeleton

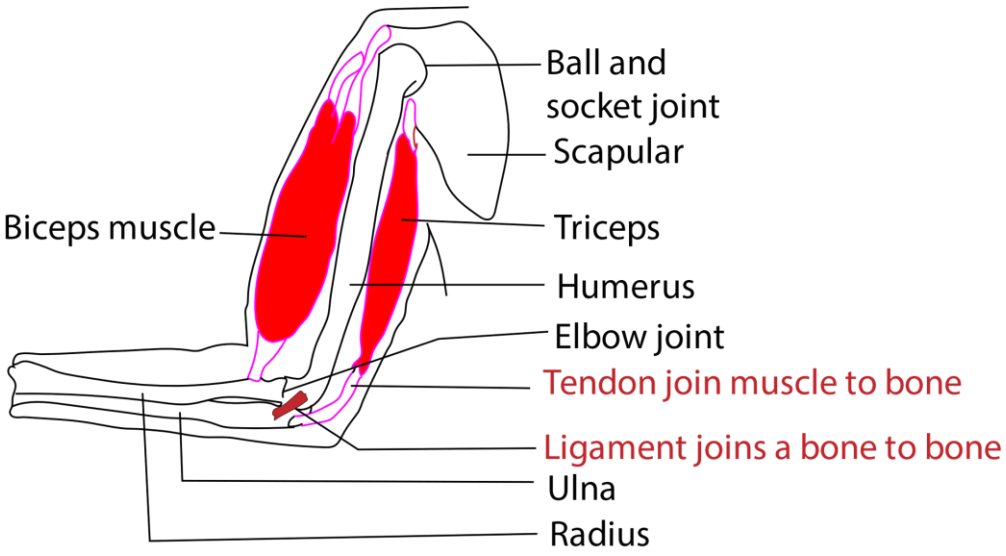
Functions of bone

(a) Protect delicate organs for example
- Skull protects the brain
- Rib cage protects the heart and lungs
- Vertebral column protect the spinal chord

- Long bones protect the bone marrow

(b) Give body shape for easy identification and a streamline shape reduce resistance during movement.
(c) Provide support
(d) Store Minerals Calcium
(e) Make blood cells

Skeletal structures of the fore arm



NB

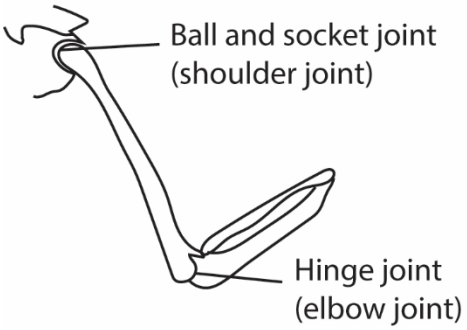
(i) **Tendon**s are tissues that join muscles to bones
(ii) **Ligaments** are tissues that join bone to bone

Joints

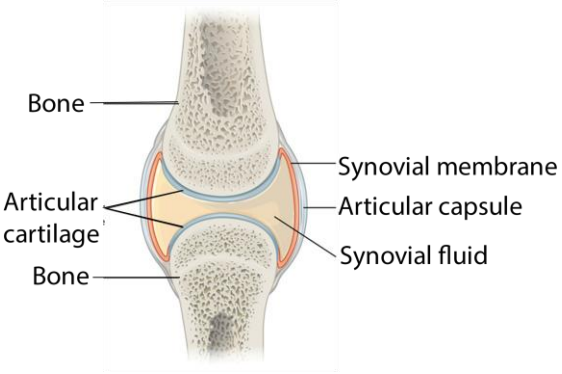
A joint is a place where joint meet.
Types of Joint

1. **Pivot joint** allows rotation movement e.g. neck
2. **Hinge joint** allow movement of bone in two planes e.g. knee, elbow and finger joints
3. **Ball and socket joints** at the shoulder and hip allow movement in many directions

A drawing of the arm bones to show positions of ball and socket joint and hinge joints



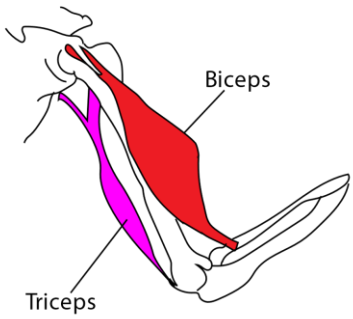
Structure of synovial joint



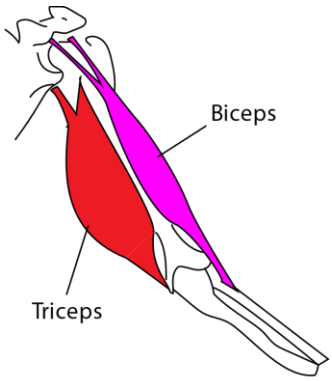
Synovial fluid and cartilages are used to reduce friction at the joint.

Antagonistic muscles

Muscles responsible for movement by contracting and relaxing against the skeleton are referred to as antagonistic muscles, i.e., when one is contracted the other is relaxed. For example, in human arm when the biceps flex and the triceps extend the arm out.



When the biceps contract it bends and curls the arm



When the triceps contract it straightens the arm

Diseases of the skeletal system

Rickets

This are poorly formed bones due to lack of vitamin D in children

Polio

It is caused by the virus through contaminated water

It prevents proper development of muscles and bones

Polio can be prevent through immunization

Leprosy

It is caused by a bacteria

If untreated it causes loss of fingers.

It is treated in hospital

Disorders of the skeletal system

(i) Cuts and wounds

Cuts and wounds are mainly caused by sharp objects.

First aid for cuts

- Remove any clothing or debris on the wound. Don't remove large or deeply embedded objects.
- Apply pressure using a clean cloth or bandage to reduce blood loss
- Apply a tourniquet to or 5-8cm above the wound if bleeding does not stop.

(ii) Strain

This is an injury to the muscle or tendons due to stretch and overuse leading to a lot of pain; such as during playing football

(iii) Sprains

A sprain is an injury in which a ligament is stretched, twisted or torn. They usually take place in joints. For example people can get sprains while walking down the step and accidentally miss a step.

(iv) Pain in abdomen

It is caused by bad sitting posture. Sometimes we sit in a way which makes the muscles of the abdomen to get squeezed. When this happens, the muscles may develop pain.

(v) Back pain

It may be caused by bad sitting posture

(vi) Fractures

A fracture is a cracked or broken bone. It can happen to any bone in the body.

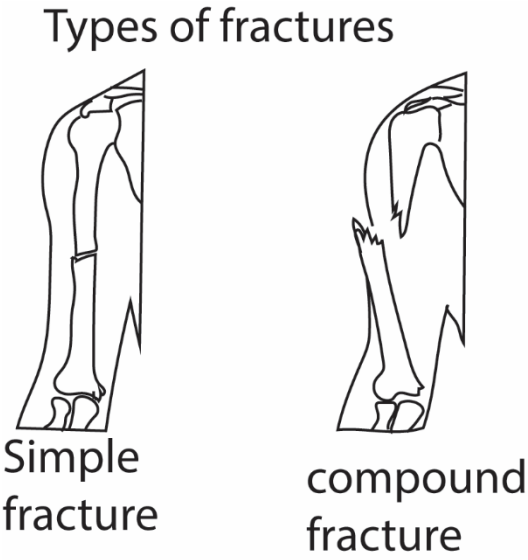
Types of fractures

- Simple fractures, also called closed fractures, are broken bones that remain within the body and do not penetrate the skin.

- Compound fractures, also called open fractures, are broken bones that penetrate through the skin and expose the bone and deep tissues to the exterior environment.

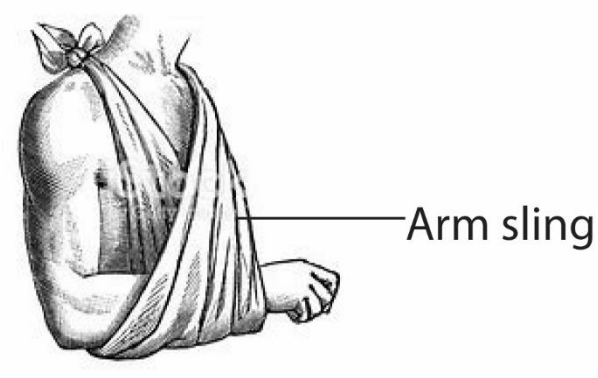
Compound fractures are considered much more serious than simple fractures because they may be complicated by deep infections if pathogens enter the body through the wound.

Antibiotics are often used to prevent possible infections that may be associated with compound fractures.



First aid for fractures

- Reduce unnecessary movements with hands, a cushion, arm sling or a simple splint.



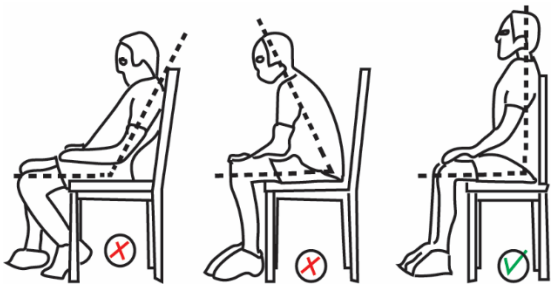
- Apply a cold pack on injured place

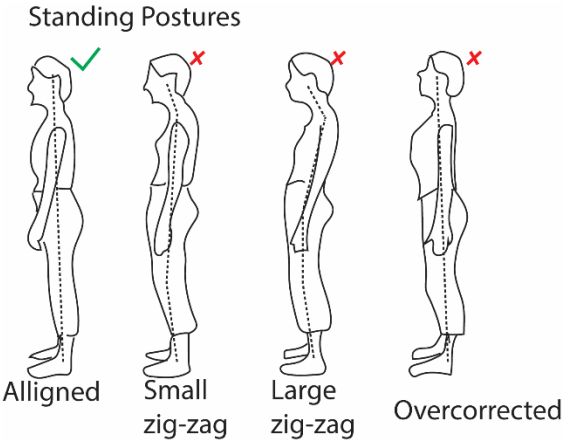
Posture

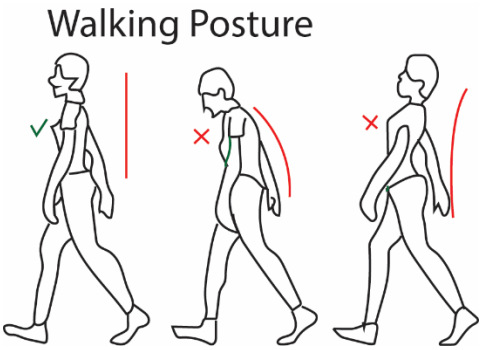
This is the way a person positions one's body while sitting, standing or walking.

Bad postures lead to bent bones which leads to back and chest pain

Sitting posture







Good health hazard to maintain skeletal system

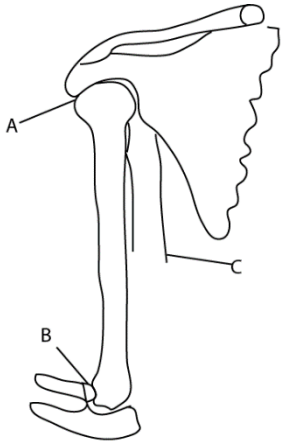
(i) Feed on a balanced diet
(ii) Sit, stand and walk with correct posture.
(iii) Avoid dangerous games like fighting that can cause injury.
(iv) Avoid climbing trees
(v) Regular exercise

Revision Questions

1. What is a compound fracture?
   ……
2. What First Aid should be given to a person with a compound fracture on the arm?
   ……..
3. (a) Give the difference between hinge joint and Ball and socket joint.

   ……

   (b) Give the function of a tendon.
   …….
   (c) Name a disease connected with the muscle and skeleton system.
   …….
4. What is the difference in the movement between a ball and socket joint and a hinge joint?
   ……
5. The diagram below is of a part of a human arm, use it to answer the questions which follow



   (a) Name the joint A
   ……
   (b) What kind of movement does the joint A allow?
   …….
   (c) Complete the drawing of muscles C to show where its lower end is attached.

   (d) If the arm is in the position shown, name the muscle which must be contracted.
   ……
6. (a) Mention the structure that joins a bone to a muscle

   ……

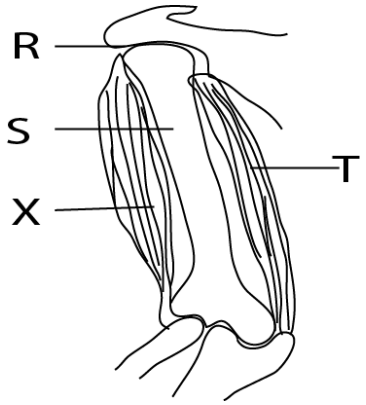
   (b) Give one example of the following types of joints
   (i) hinge joint: **……**
   (ii) ball and socket joint: **……**
   (c) Name the food substance that help in formation of strong bones.

……..

7. Give an example of a ball and socket joint in human being.

……

8. 52. The diagram below shows the arm. Study it and answer the questions that follow.



(a) Name the Joint labelled R: ……

(b) Name the bone labelled S: ……

(c) What happens to muscles T and X when the fore arm is raised?

T: ……..

X: ……

9. You are running home with your friend after school and one of your friends accidentally falls down and his thigh bone breaks

(a) What do we call the injury he got?

……..

(b) Give two things you will do to give him First Aid

……

(c) What would you prepare to enable you carry him properly

……

10. Which bone in the human skeleton protects the brain?

……

11. John fell off a bicycle and broke his thigh bone.

(a) Name the injury which john got.

……..

(b) State any two ways in which john can be given First Aid.

(i) ……

(ii) **……..**

(c) What is the importance of giving first Aid to a person like John?

……

……

12. (a) Give any one part the human body where each of the following joint is found

(i) Ball and socket joint: **…….**

(ii) Hinge joint: **……**

(iii) Gliding joint: **……**

(b) Which one of the above joint can make an all –round movement?

……..

13. Give any one function of the human skeleton.

……

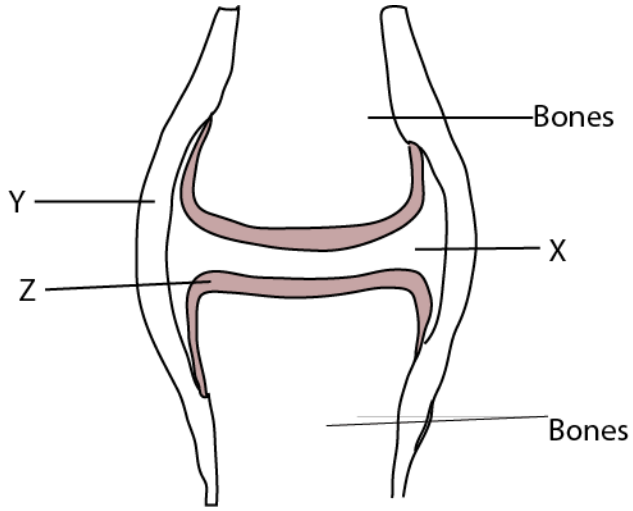
……

14. Why is a sling used when giving First Aid to a person with a broken hand?

……..

15. The diagram below shows a human joint.

Use it to answer the questions that follow.



(a) Name the part marked with letter **Y** and **Z**

(i) **Y …….**

(ii) **Z …….**

(b) Give any one function of the fluid found in the place marked with letter **X**

……

(c) What type of joint is shown in the diagram above?

……

16. Name one structure in a human which connects bone to bone.

……

17. (a) State the function of each of the following structure in the human skeleton.

(i) Ligament

……..

(ii) Tendon:

……

(b) Give one example of a long bone in a human skeleton.

……

(c) Name one disease that affects a human skeleton.

……

18. What kind of accident requires the use of splints in giving First Aid?

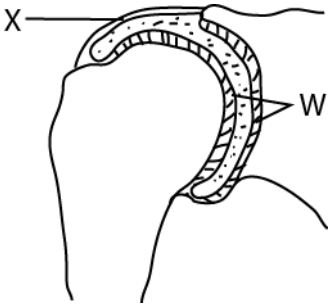
……..

19. The table below shows joints and their position in the human body.
Study and complete it correctly

Joints	Position in the body
Pivot joint	
	shoulder
Hinge joint	
	Skull

The diagram below shows part of a joint.

Study and use it to answer questions 20 and 21.

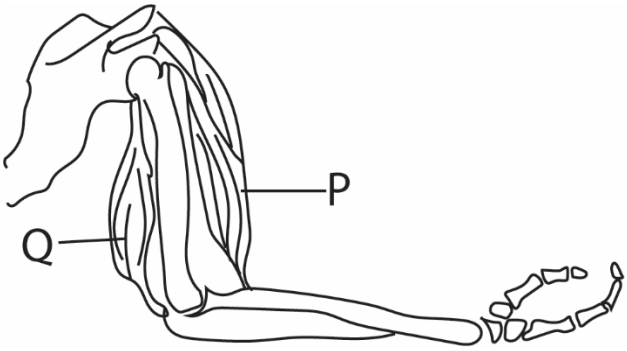


20. Name the part marked X

    ……

21. Using letter W, label the part that reduces friction in the joints, apart from the synovial fluid.

The diagram below is of a human arm. Study and use it to answer questions 22 and 23



22. Name muscle P

    ……..

23. What happens to muscle Q when the arm is raised?

    ……

24. (a) Name any two bones that form the joint at the knee of the human body

    (i) ……

    (ii) ……..

    (b) What name is given to the jointed at the knee?

    ……

    (c) In which one way is friction reduced at the joints

    ……

25. State any sign of a compound fracture

    ……

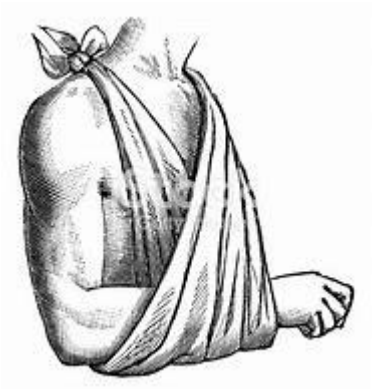
Suggested answer

26. What is a compound fracture?

This is an injury where bone(s) break and come out of the flesh

27. What First Aid should be given to a person with a compound fracture on the arm?

Tie a splint around the broken bone and hold the arm in one position by a sling.



28. (a) Give the difference between hinge joint and Ball and socket joint.

Hing joint moves only in one plane whereas ball and socket joint moves in all directions.

(d) Give the function of a tendon.

It joins a muscle to a bone

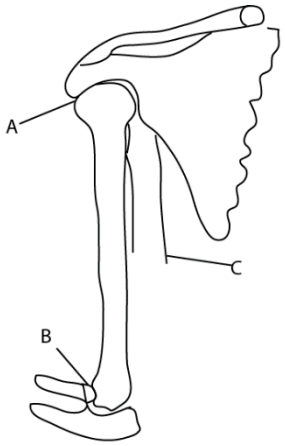
(e) Name a disease connected with the muscle and skeleton system.

Polio

29. What is the difference in the movement between a ball and socket joint and a hinge joint?

Ball and socket joint move in all directions while a hinge joint moves in one plane only.

30. The diagram below is of a part of a human arm, use it to answer the questions which follow



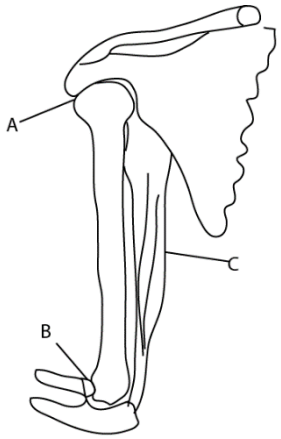
(e) Name the joint A

Ball and socket joint

(f) What kind of movement does the joint A allow?

Allows movement in one plane

(g) Complete the drawing of muscles C to show where its lower end is attached.



(h) If the arm is in the position shown, name the muscle which must be contracted.

Biceps

31. (a) Mention the structure that joins a bone to a muscle

Tendon

(b) Give one example of the following types of joints

(i) hinge joint: **knee, elbow**

(ii) ball and socket joint: **hip joint and shoulder joint**

(c) Name the food substance that help in formation of strong bones.

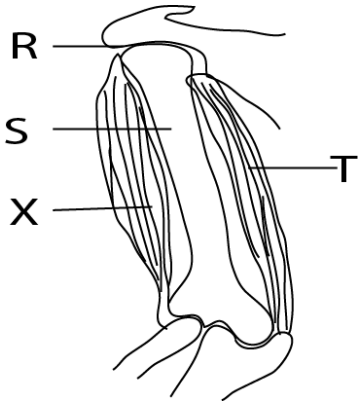
Calcium and phosphorus

32. Give an example of a ball and socket joint in human being.

Shoulder joint

Hip joint

33. 52. The diagram below shows the arm. Study it and answer the questions that follow.



(d) Name the Joint labelled R: **ball and socket joint**

(e) Name the bone labelled S: **Humerus**

(f) What happens to muscles T and X when the fore arm is raised?

T: **(triceps) - relaxes**

X: **(biceps) - contracts**

34. You are running home with your friend after school and one of your friends accidentally falls down and his thigh bone breaks

(a) What do we call the injury he got?

Fracture

(b) Give two things you will do to give him First Aid

Applying a splint around the broken bone area

Prevent movements

Stop breeding

(c) What would you prepare to enable you carry him properly

Stretcher

35. Which bone in the human skeleton protects the brain?

The skull

36. John fell off a bicycle and broke his thigh bone.

(d) Name the injury which john got.

A fracture

(b) State any two ways in which john can be given First Aid.

(i) **apply a splint at the broken area**

(ii) **give a pain killer**

(c) What is the importance of giving first Aid to a person like John?

Reduce pain

Prevent injury from worsening

37. (a) Give any one part the human body where each of the following joint is found

(i) Ball and socket joint: **shoulder and hip**

(ii) Hinge joint: **elbow and knee**

(iii) Gliding joint: **wrist**

(b) Which one of the above joint can make an all –round movement?

Ball and socket joint

38. Give any one function of the human skeleton.

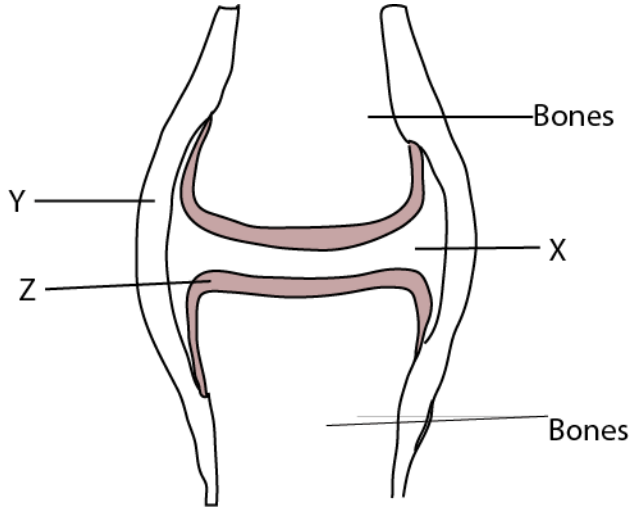
Provide shape of organism
Provide support
Manufacture red blood cells
Store minerals like phosphorus and calcium

39. Why is a sling used when giving First Aid to a person with a broken hand?

To **minimize movement of the broken hand**

40. The diagram below shows a human joint.

Use it **to answer the questions that follow.**



(a) Name the part marked with letter **Y** and **Z**

(i) **Y** **Ligament**

(ii) **Z** **cartilage**

(b) Give any one function of the fluid found in the place marked with letter **X**

The synovial fluid reduce friction

(c) What type of joint is shown in the diagram above?

Hinge **joint**

41. 13. Name one structure in a human which connects bone to bone.

Ligament

42. (a) State the function of each of the following structure in the human skeleton.

(i) Ligament: **joins a bone to a bone**

(ii) Tendon: **joins a bone to a muscle**

(b) Give one example of a long bone in a human skeleton.

Femur**, Humerus, tibia, fibula, ulna, radius.**

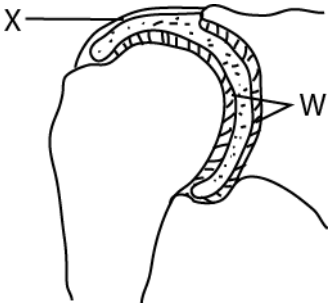
(c) Name one disease that affects a human skeleton.

Polio, rickets, osteomyelitis, Yaws, cancer of the bones

43. What kind of accident requires the use of splints in giving First Aid?
    F**racture**
44. The table below shows joints and their position in the human body.
    Study and complete it correctly

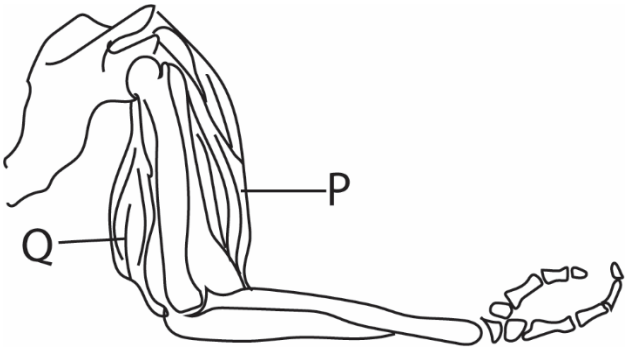
Joints	Position in the body
Pivot joint	Neck
Ball and socket joint	shoulder
Hinge joint	Knee
Suture joint	Skull

The diagram below shows part of a joint.
Study and use it to answer questions 20 and 21.



45. Name the part marked X
    Ligament (joins a bone to a bone)
46. Using letter W, label the part that reduces friction in the joints, apart from the synovial fluid.

The diagram below is of a human arm. Study and use it to answer questions 22 and 23



47. Name muscle P

Biceps

48. What happens to muscle Q when the arm is raised?

Relax

49. (a) Name any two bones that form the joint at the knee of the human body

(iii) **Fermur**

(iv) Tibia

(e) What name is given to the jointed at the knee?

Hinge joint

(f) In which one way is friction reduced at the joints

By smooth cartilages

By synovial fluid.

50. State any sign of a compound fracture

Broken bones fierce through the skin