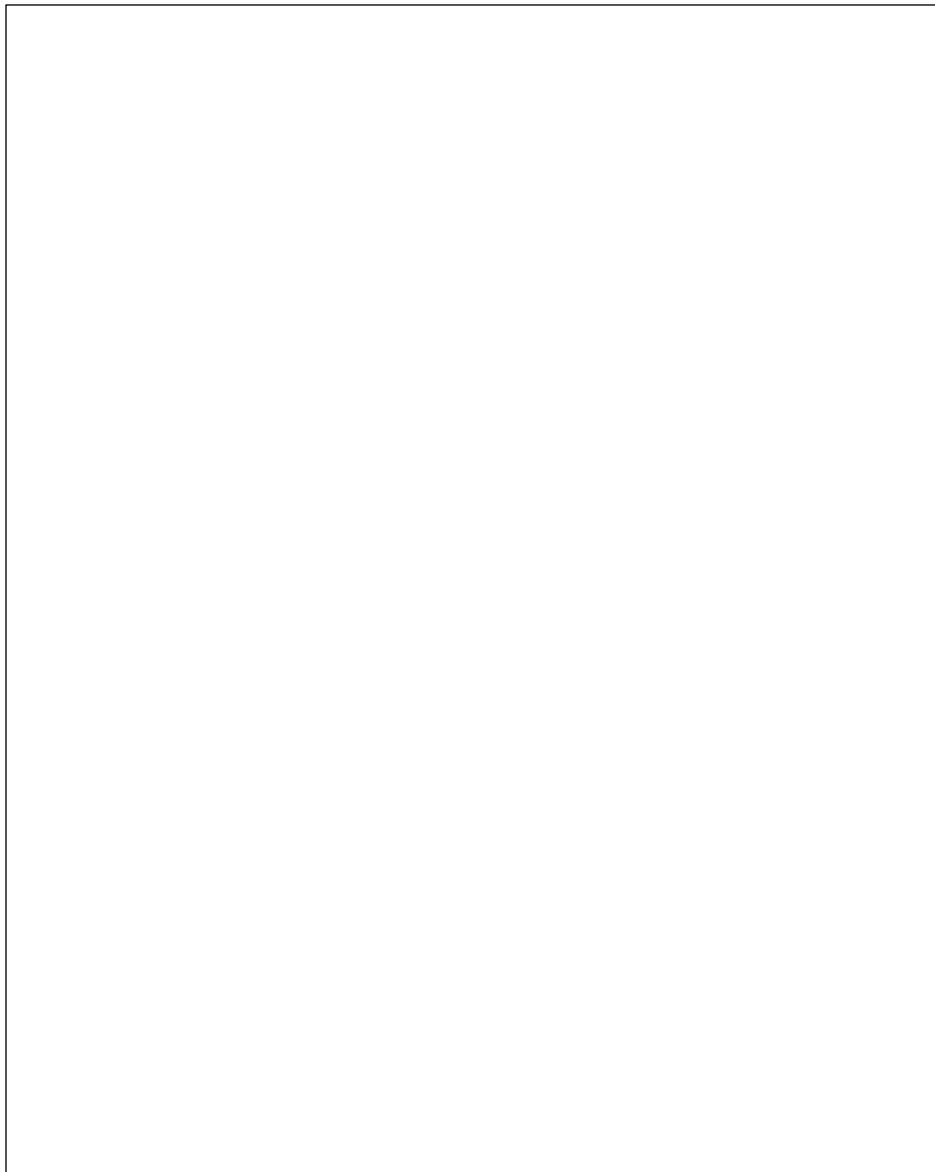


The material presented here is all in preparation for the Vyasa Purnima Term 2020.

Please have a print out of this document for the first Integrated Science class with all the work completed. You will be tested on the material present here. Therefore, it is in your best interest to thoroughly read, understand and complete the below content.

The Skeletal System

1. Produce a labelled diagram depicting the human skeletal system.



Functions of the skeleton in man:

1. Protection of organs:
 - Skull protects the brain

- The vertebral column protects the spinal cord
 - The ribs protect the heart, lungs and parts of the liver.
2. Supports the body:
 - The skeleton acts as a frame supporting the soft body parts and keeping the body upright.
 3. Movement:
 - The coordinated movement of many bones results in walking, running and all other movements.
 4. Manufacture of red and white blood cells:
 - Red and white blood cells are made in the bone marrow of the pelvis, ribs, sternum and leg bones.

Movement in a limb of man

Movement in a limb is brought about by many tissues such as muscles, tendons, ligament and bones all working together.

Bones are able to move because of the presence of joints.

Bones are attached to each other by ligaments.

Muscles are attached to bones by tendons.

Muscles around bones move the bones when they shorten (contract) and lengthen (relax).

Movement is brought about by the contraction and relation of antagonistic muscles.

Antagonistic Muscles

Antagonistic muscles are pairs of muscles that always work together i.e. when one is contracting, the other is relaxing.

Antagonistic muscles found in the upper arms are triceps and biceps. Movement is brought about when the muscles pull on the bones.

<p><u>Diagram showing the position of the biceps and triceps when flexing the arm.</u></p>	<p><u>Diagram showing the position of the biceps and triceps when extending the arm.</u></p>
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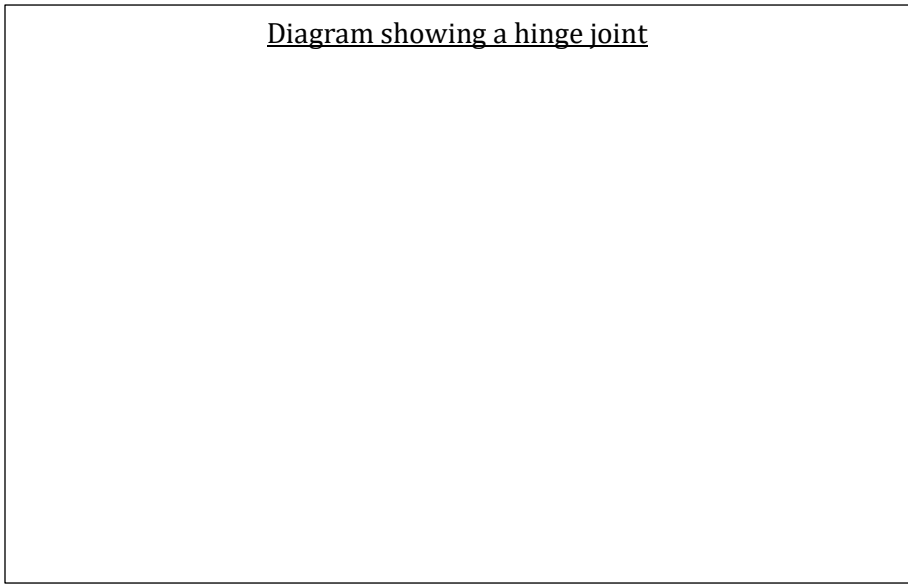
Joints

Types of joints:

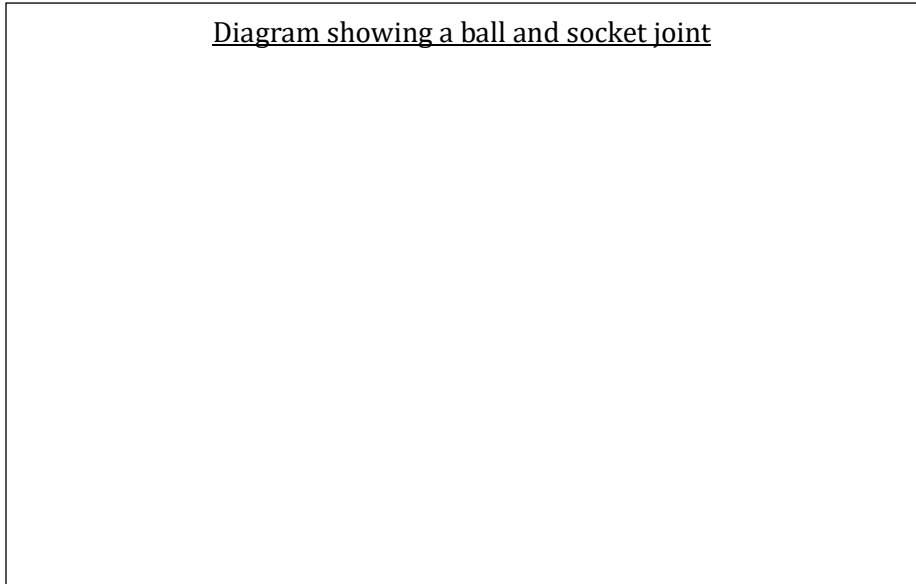
1. Immovable

2. Partly movable
3. Movable

1. **Immovable joints:** The bones that form this joint are fused together and allow no movement e.g. the cranium and pelvic girdle. Immovable joints are also known as sutures.
2. **Partly movable/ gliding joints:** These joints allow some movement e.g. joints between tarsals (ankle) and carpals (wrist). The bones can slide over each other producing the movement seen in the wrist and ankle. A partly movable joint also exists between the atlas and axis at the top of the neck allowing movement of the head in relation to the spine e.g. nodding or shaking. This joint in the neck is also known as a pivot joint.
3. **Movable joints/ synovial joints:** Synovial fluid in these joints reduces friction allowing free movement of the bones. There are two types of synovial joints:
 - Hinge joint- this allows movement in one plane and is capable of carrying heavy loads e.g. elbow, knee and finger joints.



- Ball and socket joint- this allows movement in all planes e.g. shoulder and hip joints.



Questions- Complete in your exercise books.

1. State the correct names for the following bones:
 - Funny bone
 - Collar bone
 - Shoulder bone
 - Skull
 - Breast bone
 - Tail bone

2. Identify the bones which make up the following
 - Fore arm (upper limb)
 - Leg (lower limb)
 - Vertebral column- cervical, thoracic, lumbar

3. What is the longest bone in the body?

4. State 5 functions of the skeleton.

5. Name the bone that have marrow within them.

6. State 2 differences between the following pairs of terms:
 - Bone and cartilage
 - Ligament and tendon

7. The synovial fluid between a hinge joint helps to reduce friction between bones. What other skeletal tissues help to reduce friction at the joint?

8. Arthritis is a disease that affects the joints:
 - What is arthritis?
 - Name three parts of the joints that can be worn away due to arthritis.
 - How does arthritis affect movement of joints?

9. Between what bones are the following joints located:
 - Elbow joint
 - Shoulder joint
 - Knee joint

10. Give 5 importance of locomotion in man.

11. What is the effect of exercise on muscle toning?

12. The figure below shows a diagram of the upper arm.

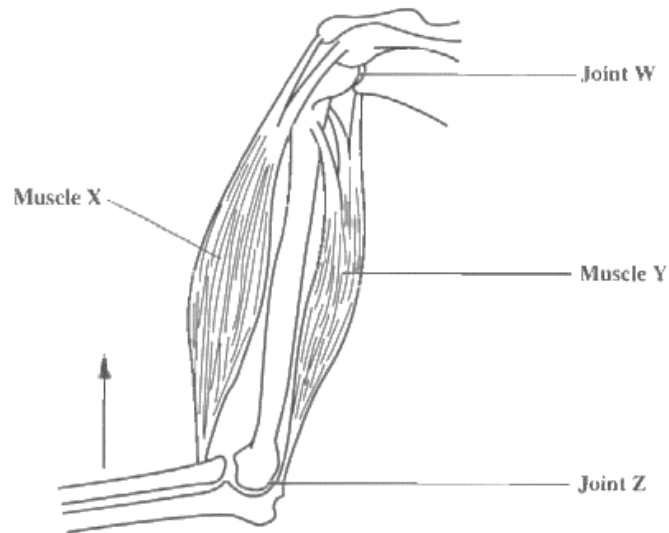


Figure 1: Diagram of the upper arm

- Name the two muscles labelled X and Y.
 - Explain what happens to muscles X and Y to raise the bones of the lower arm.
 - What types of joints are labelled W and Z?
 - Explain how the joints W and Z differ.
13. In a degenerative disease which affects elderly people, the cartilage in the knee is lost. Predict how the loss of knee cartilage would affect the function of the knee.
14. A cricketer, who injured his biceps, cannot bend his arm. Use your knowledge of bones, tendons and muscles to explain why he cannot bend his arm.
15. Explain why a broken shoulder bone would affect movement of the lower arm.

Assignment #1-Total 30 marks

Due: First Integrated Science class

Complete this assignment in your exercise books. Pay attention to your presentation.

List 3 physiological, 3 social and 3 economic effects of EACH of the following:

- 1. Alcohol**
- 2. Prescription drugs**
- 3. Non-prescription drugs**
- 4. Illegal drugs**
- 5. Hormonal injections**
- 6. Diet pills**
- 7. Steroids**