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Grade; 5

Subject;Science

Topic; The skeletal system

Key words

Skeleton :framework of bones that gives shape, support and strength to the body

Joints : place where two bones meet

Voluntary muscles : muscles that are under our control

Involuntary muscles : muscles that are not in our control

Cardiac muscles : muscles that are present only in the heart

Posture : the position in which holding our body while sitting or standing

Ribs : curved bones near the chest helps to protect lungs

Vertebrae : a long bony structure which protects the spinal cord.

Exercise

Short Answer Questions:

1. What is the importance of skeletal System?

Ans: The importance of skeletal system is:

- (i) It gives shape and support to the body.
- (ii) It protects delicate internal organs of the body.
- (iii) Bones are attached to the muscles and thus helps in movement.

2. What is (a) sternum (b) joint?

Ans: (a) Sternum: A long and flat bone present at the center of the chest to which ribs are attached is called sternum.

(b) Joints: The place where two bones meet is called a joint.

3. How do involuntary muscles differ from voluntary muscles?

Ans: Voluntary muscles Involuntary muscles
The muscles that are under our control are called voluntary muscles. The muscles that are not under our control are called involuntary muscles. For example- tongue, arms and legs
For example- intestine and stomach.

4. What type of food should we eat for healthy bones and muscles

Ans: We should eat a balanced diet to keep our bones and muscles healthy. We should eat food items that are rich in calcium for (e.g.— milk, cheese and curd) and proteins (e.g.— eggs, fish, meat and pulses)

5. Why it is important to keep the posture correct while sitting or standing

Ans: It is important to keep the posture correct because wrong posture can cause discomfort in our backbone and joints. This may lead to muscular pain, joint pain and back pain.

B, Long Answer Questions:

1. Describe the structure of (a) skull & (b) backbone

Ans: (a) Skull: Skull is a hollow and round structure present in head, It consists of brain box and facial bones. Skull has 22 bones out these 8 bones form the brain box and 14 form the facial bones. the bones of skull are fixed except lower jawbone.

(b) Backbone: Backbone is a long bony structure made up of 33 bones called vertebrae. The backbone protects delicate spinal cord. The vertebrae can move over each other. This allows us to bend and twist our back.

2. How many types of joints are found in human body? Describe each one of them giving one example

Ans : There are two types of joints in the human body

Immovable joints: These joints do not allow any movement between the bones.

Movable joints: These joints allow the movement of bones. They are of four types-pivot joint, ball and socket joint, hinge joint, gliding joint.

(a) Pivot joint: It allows to move our head upward, downward and sideways. It is found in first and second vertebrae of neck region,

(b) Ball and socket joint: It allows the bone to move in all directions. It is found in shoulders and hips.

(c)Hinge joint: It allows the bones to move only back and forth. It is found in knees, elbows, toes and fingers.

(d)Gliding joint: It allows the bones to move smoothly against each other. It is found in the bones of wrist and ankle and between bones of vertebral column.

3.How many types of muscles are found in human body? Describe each of them with example.

Ans ; There are three kinds of muscles:

- Voluntary muscles: The muscles that are under our control are called voluntary muscles. E.g. — muscles of tongue, arms and legs.
- Involuntary muscles: The muscles that are not under our control are called involuntary muscles. E.g. — muscles of stomach and intestine.
- Cardiac muscles: The muscles that are present only in the heart are called cardiac muscles. They are also not under our control. They work continuously and never get tired.

4. You can move your arm in all directions but not your knee. Why?

Ans: The difference in the range of motion between the arm and the knee is due to the types of joints present in these body parts.

Arm (Shoulder): The shoulder joint is a ball and socket joint, allowing a wide range of motion. It enables movements in multiple directions, such as forward, backward, sideways, and rotational movements,

Knee: The knee joint is a hinge joint) allowing primarily back-and forth movement, like a hinge (' on a door. While the knee joint provides stability for activities like walking and running, it doesn't allow the same degree of multi-directional movement as the ball and socket joint in the shoulder.

Critical Thinking Corner

1. How does the structure of the backbone support our daily activities and movement?

Ans : Structure of the Backbone and Support for Daily Activities:

- The backbone, or spine, is made up of vertebrae that are stacked on top of each other, separated by intervertebral discs. The spine has a natural curvature that provides stability and support to the body.
- The spine's structure allows for flexibility, facilitating movements such as bending, twisting, and leaning. Muscles and ligaments attached to the spine aid in maintaining posture and balance during various activities.
- The spinal column also houses and protects the spinal cord, a crucial part of the nervous system. Nerves branching out from the spinal cord contribute to the communication between the brain and the rest of the body, influencing voluntary and involuntary movements.
- Overall, the structure of the backbone provides a strong yet flexible framework that supports our daily activities, ranging from simple tasks to complex movements.

2. How might the skeleton of a 4 year old child be different from the skeleton of an adult

Ans : Differences in the Skeleton of a 4-Year-Old Child and an Adult:

- Number of Bones: The skeleton of a 4-year-old child has more bones than that of an adult. As a child grows, some bones fuse together during the process of ossification.

- Growth Plates: Children have growth plates (epiphyseal plates) at the ends of long bones, allowing for longitudinal bone growth. These plates gradually close as the child reaches adulthood.
- Bone Density: Adult bones are generally denser and stronger than those of a child. Bone density increases as a person grows and reaches peak density in early adulthood.
- Proportions: The proportions of body parts may differ between a child and an adult due to growth and development. For example, a child's head may be larger in proportion to the body compared to an adult.
- Joint Development: Joint structures and the degree of ossification in joints may vary. Some joints may not be fully developed in a child, affecting their range of motion.
- These differences highlight the dynamic nature of the skeletal system, undergoing significant changes during the growth and development stages from childhood to adulthood.

Application/Skill-based Questions:

C. Think and Answer:

1. What would happen if our backbone is made up of a single long bone instead of 33 small bones?

Ans; The backbone, or spine, is made up of 33 small bones called vertebrae, separated by inter-vertebral discs. This structure provides flexibility, support, and protection to the spinal cord. If the backbone were a single long bone instead of 33 small bones, it would severely limit flexibility and movement. The ability to bend, twist, and lean, which are essential for various daily activities, would be compromised. The spine's segmented structure allows for a wide range of motion while maintaining stability. A single long bone would not provide the necessary flexibility for activities such as walking, bending, or turning.

2. Imagine that the lower jaw in your skull is not movable. How will it affect your daily life?

Ans: The lower jaw, or mandible, is the only movable bone in the skull. Its mobility is essential for actions such as talking, chewing, and facial expressions. If the lower jaw were not movable, it would significantly impact daily life. Basic functions like speaking and eating would become extremely challenging. Chewing food would be limited, potentially affecting nutrition and overall health. Furthermore, facial expressions, which are crucial for communication and emotional expression, would be restricted. The ability to convey emotions and communicate effectively would be impaired, influencing social interactions and relationships.

D. Look at the given picture and answer the following questions:

1. Name the given part of the skeleton . – **Ribcage**
2. What are the thin and curved bones called- **Ribs**
3. Name the long and flat bone that is present at the centre- Stern





