CHAPTER 5
HUMAN BODY: THE SKELETAL SYSTEM

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Engagement

Activities that use bones & muscles	Activities that do not use bones & muscles
Walking and jogging	Blinking of eyes
Dancing	Thinking
Playing sports	Seeing
Stair climbing	Sneezing
Jumping	Smelling

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	Name	Location	Image
Longest bone	Femur	Thigh	
Shortest bone	Stapes	Middle ear	

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Engagement

Amazing facts about muscles are:

1. Our body contains more than 650 muscles.
2. The largest muscle in the body is gluteus maximus.
3. The smallest muscle in the body is in the inner ear.
4. Muscles are attached to bones by tendons.
5. Muscles make up about 40 percent of our total body weight.
6. The hardest working muscle in the body is the heart.

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Engagement

The long-term effects of continuously using cellphones for long hours are:

- Digital eye strain
- Neck problems
- Increased illness due to germs
- Sleep disturbances
- Anxiety
- Lack of concentration
- Dizziness

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Value Inculcation

1. As we get older, our bones lose density, muscle lose flexibility and joints become worn, adversely affecting our mobility.

We should make following immediate changes in our lifestyle to avoid it:

1. We should maintain a healthy weight.
2. We should eat a balanced diet.
3. We should ensure adequate calcium and Vitamin D is included in our diet.
4. We should do regular exercise.

5. Exposure to sunlight also helps our body to prepare Vitamin D and keep the bones healthy.

2. I will advise my mother to take care of following things:

1. I would tell her to sit in a proper posture.
2. I would advise her to use a desktop, if possible, instead of a laptop as one is more prone to bending in front of laptops.
3. She should take frequent breaks from using the laptop/desktop.
4. She should stretch herself in between continuous usage of laptop/desktop.
5. She should keep the laptop/desktop at a higher level so that she does not need to bend her neck.

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Evaluation
1. Fill in the blanks

1. Skeletal
2. Bone marrow
3. Ligament
4. Cartilage
5. Bones
6. Skeletal
7. Lower jaw
8. Mandible
9. Girdle
10. Pelvic

2. Name the following

1. Collagen
2. Pivot
3. Hinge
4. Cardiac
5. Vertebrae
6. Sternum
7. Calcium

3. Odd one out
1. Short. All others are movable joints.

2. Rough. All others are type of muscles.

4. Identify the joints
Spine: Gliding joint
Knee: Hinge joint
Hip: Ball and socket joint
Hand: Gliding joint
Foot: Gliding joint

5. Answer the following

1. The skeletal system consists of bones, joints, muscles, ligaments, tendons and cartilages.

2. Rib cage is made of 24 curved bones, called ribs, with 12 bones on each side. The ribs are connected to a long flat bone, at the front of the ribcage located at the centre of the chest, called the sternum. The ribs are connected to the spine at the back. The last two pairs of ribs are not attached to the sternum and are called floating ribs.

3. A girdle is an encircling structure. The human body has two girdles
    1. The shoulder or pectoral girdle
    2. The hip or pelvic girdle

Both of them are encircling bony structures supporting the upper limbs and the lower limbs respectively. The shoulder girdle consists of four bones - two shoulder blades and two collar bones. The hip girdle is made of three fused bones.

4. Voluntary muscles: Voluntary muscles are the muscles that are attached to the bones and have the main function of contracting to facilitate movement of our skeleton. They are called voluntary muscles because we have direct control over them through messages from our brain. They are found in hands, arms, feet and legs. They are also called skeletal muscles. e.g. biceps, triceps.

5. Involuntary muscles do not have the ability to control their movements. They are found in the walls of hollow organs such as stomach, oesophagus, intestine and walls of blood vessels.

6. Important functions of bones in our body are:

- **Support:** They provide shape and support to our body.
- **Protection:** They protect the internal delicate and important organs of our body such as brain, heart, lungs and spinal cord.
- **Assisting in movement:** They are attached to muscles and allow movement of different body parts when the muscles contract.
- **Production of blood cells**: The bone marrow inside larger bones produces new blood cells.

7. Joints are the areas in our skeletal system where two or more bones meet. Joints make our skeleton flexible. The movement would be impossible without them. At the joints, the bones can be connected in a number of ways. They may be connected by ligaments or by cartilage.

Joints can be fixed or moveable. The **fixed joints** do not allow movement between the bones meeting at that joint. **Movable joints** are the joints that allow some degree of free movement.

They perform the following important functions:
- Joints enable motion and provide flexibility to the rigid bones of the skeletal system.
- Different joints allow different types of motion.

8.

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Involuntary muscles: They do not have the ability to control their movements. They are found in the walls of hollow organs such as stomach, oesophagus, intestine and walls of blood vessels.

6. Give scientific reasons.

1. Smooth muscles are known as involuntary muscles due to our inability to control its movements. Smooth muscles are found in the

walls of hollow organs such as the stomach, oesophagus, intestine and walls of blood vessels.

2. Bones, muscles and joints are vital for our movement. They help us to accomplish all our physical tasks. Bones provide our basic body structure, joints allow flexibility of movements, and muscles hold them together to make it all possible. Therefore, it is important that we should keep our bones and muscles strong and healthy.

3. We must include calcium and Vitamin D in our diet because calcium helps in keeping our bones strong and repairing cartilage joints. Food items like citrus fruits, tomatoes etc. are good sources of calcium. Vitamin D also keeps our bones strong. Food items that are a good source of Vitamin D are eggs, fish, soy milk etc.

4. Posture means how our body is positioned when we sit, stand or lie down. Proper posture is extremely important as it lessens stress on muscles, ligaments and tendons. Poor posture can lead to discomfort and injury. We should ensure proper posture at all times while sitting, standing and lying down.

7.

1. Backbone
2. It is a row of connected bones that go down the middle of the back and protect the spinal cord. It provides us with strength, support and flexibility.
3. It consists of 33 bones.
4. The individual bones are called vertebra.
5. Vertebrae, spinal cord

8. Think and answer

1. Fingers and arms do not move in the same way. Fingers move forward and backward because they have metacarpal joints. Arms move in all directions because they have ball and socket joints.

2. If we did not have skeletal system, we would have to wriggle on the floor to reach any place. The skeletal system is made up of bones, joints, muscles, ligaments, tendons, and cartilages.

3. No, skeletons do not move around during night during Halloween.