Objectives

By the end of this unit the children should:

- Be able to identify the role of muscles in moving the body.
- Understand that muscles work in pairs, contracting and relaxing, to move the bones.
- Know that muscles are attached to bones with tendons.
- Know that some muscles move involuntarily, such as the heart or diaphragm.
- Be able to locate different types of joint on a human skeleton.

Key Teaching Points

There are hundreds of muscles in the human body. These enable the skeleton to move. Many muscles work in pairs to achieve movement: one muscle contracts (becomes shorter and fatter) as the other relaxes (becomes longer and thinner), and vice versa. Some muscle movements are involuntary, such as the heart and diaphragm. Wherever two or more bones of the skeleton meet, there is a joint. There are different types of joint, including hinge, ball and socket and semi-moveable.

Starter Activity (10 minutes)

Note: If possible, this activity is best carried out in the playground or gym, as it might include hopping, skipping, jumping.

Ask the children to identify, or demonstrate, the different ways they can move around. As they do so, ask them to think about which muscles they have to use the most to achieve a particular movement.

Ask some children to demonstrate their movements and locate the key muscles. Children may be familiar with the names of some muscles. They may be able to name biceps and triceps in the arm, abdominal (stomach) muscles, hamstrings, quadriceps (“quads”) and calf muscles in the legs. It is worth pointing these out, although the children would not be expected to remember their names at this stage.

Explain to the children that often a number of muscles are used to perform one movement, and many muscles in the body work together in pairs. Ask the children to hold out one arm and feel (with the opposite hand) how the biceps and triceps move as they bend and straighten that arm.
Main Activity (40 minutes)

Play the film Amazing muscles.

Ask:
1) What words were used to describe the opposing actions of muscles to move bones? **Contract and relax.**
2) What happens to the shape of a muscle when it contracts? **It becomes shorter and fatter.**

Organise the children into groups of four or five. Give each group a copy of the Using muscles images. Ask them to act out the movements of the different sports, identify which muscles are the most important to each, and annotate this information on the sheet.

After 10 minutes, discuss the answers as a class.

Explain to the children that the muscles are attached to the bones by tissue called tendons. Point out that you can feel the tendon that connects the calf muscle to the heel at the ankle joint. This is called the Achilles tendon.

Ask the children to consider the way the ankle joint moves, and compare this to other joints of the body. It is quite a complex joint because there are many bones involved.

Play the film Ball and socket joint.

Display the Joints classroom visual on the whiteboard. Explain to the children the types of movement at both of these joints. A hinge joint – like the hinge of a door – allows bending and straightening in one direction only. A ball and socket joint allows rotational movement.

Ask the groups to identify where in the human body these different types of joint can be found. Encourage the children to explore the movement in each of these joints before classifying them.

Answers

**Hinge joint:** knee, elbow, fingers and toes.

**Ball and socket:** hip and shoulder.

Point out that other types of joints can be found in the body. Semi-moveable joints are joints that only allow a small amount of movement. Ask: Where on the body do you think you would find semi-moveable joints? **Vertebrae and ribs.**

Further Questions

- Can you name any muscles that work without you even thinking about them (involuntary muscles)? **The heart, the diaphragm, the muscles controlling the bladder, the muscles in your eyes.**
Use one or all of the following films to conclude the lesson:

Play the film **Pixelate.**
Point out that the human tongue is a group of eight muscles, which make it very flexible.

Play the film **Odd one out.**
(You can pause at **00:30** and ask the children to discuss their answers with a partner.) Ask: Can you name another example of a ball and socket joint? The shoulder joint.

Play the film **True or false.**
(You can pause at **00:22** and ask the children to vote.)

Play the film **Clip.**