How do we move?

Strand
LIVING THINGS

Strand unit
Human life

Objective
- *explore and investigate how people move*

Working scientifically
- *Questioning*
- *Observing*
- *Predicting*
- *Investigating and experimenting*
- *Recording and communicating*

Designing and making
- *Exploring*
- *Making*
- *Evaluating*

Background information

There are 206 bones in the body, known collectively as the skeleton. The skeleton has three jobs:

- *To protect our body parts. The skull protects the brain, ribs protect the heart and lungs and the backbone protects the spinal cord.*
- *To support our body. The skeleton allows us to stand upright and holds up our internal organs.*
- *To help us move. Muscles are joined to our bones. Our bones have joints which enable the skeleton to bend. Joints and ligaments connect the bones to each other. Within the joints is cartilage that enables smooth movement.*

  Muscles allow movement. They always work in pairs. To move a joint, one muscle gets shorter (contracts) and pulls the bone, while the other muscle gets longer and relaxes (stretches).

  Voluntary muscles, which cover the skeleton, have two important tasks. One is to produce movement and the other is to help keep the body upright.

  Involuntary muscles move when your body needs them to work. They move automatically to keep body parts such as the heart and intestines operating.

Before the lesson

Materials needed
- A model or poster of a human skeleton, model or poster of the human body with visible muscles, books or videos related to the skeletal and muscular system.
- Hard cardboard, scissors, split pins, adhesive tape, thick string.
- Book: 'The Magic School Bus in the Human Body'.

Preparation
- Suggestion: Prepare labels to attach to the posters or models (e.g. skull, humerus, jawbone, kneecap, shoulder blade, femur, backbone, pelvis, ribs, collarbone).

The lesson

Stimulus
- Read the book (or view the video) 'The Magic School Bus in the Human Body'. Discuss the parts of the body.
- Ask the pupils to stand and feel their own leg bones, ribs, skull and backbones. What would happen if they didn't have a skeleton? Ask the pupils to move some of their smaller bones, such as their fingers, toes and jaws. How are they attached?

What to do
- Use the skeleton model or poster to show the structure of the skeletal system. Discuss the skeleton and the names of specific bones. Use labels to match parts.
- Look at the skull, the ribs and the backbone. Why are they there? What are they protecting? (See Background information). Discuss the other functions of the skeletal system. Could we exist without a skeleton?
- Pupils complete Question 1.
- Ask pupils to orally give the answers to the labelling activity (Question 2) as a class. Note: This is a learning activity, not a test, so sharing information is important. Refer to labels on model or chart.
- Study the model or poster of the human body with visible muscles. Ask the pupils, 'Why do we have muscles? What is their function?'.
- Ask the pupils to stand up and stretch out an arm. Can they feel their muscles? Explain that muscles work in pairs. Gently feel the top muscle (bicep) and bottom muscle (tricep). Pull the arm up. Draw a diagram on the board (or construct a simple model using wood and elastic bands) that shows the top muscle becoming shorter as it contracts and the bottom muscle stretching as it relaxes.
- Pupils work in pairs to make their model arm.
- Once completed, let the pupils play with their arm. Ask them to report to the class what they have learnt about the muscles in their arm.

After the lesson

Answers

1. (a) To protect our body parts: skull–brain, ribs–heart/lungs, backbone–spinal cord.
   (b) To support our body: It lets you stand upright and holds up the body parts.
   (c) To help us move: Muscles joined to the bones, the bones have joints so the skeleton can bend.
2. (a) skull (b) jawbone (c) ribs (d) humerus
   (e) backbone (f) femur (g) pelvis (h) kneecap
3. Teacher check – observation assessment.

Additional activities
- Build skeletons using paper strips and split pins. Label body parts.
- Use pieces of wood and elastic bands to illustrate how muscles work.
- Study diagrams of larger-boned animals (e.g. cow) and smaller animals (e.g. rat).

Display ideas
- Display models and posters with pupil labels and explanations of the functions attached.
- Find pictures in magazines of people doing voluntary and involuntary actions (such as sneezing). Attach underneath the correct headings.

How do we move?

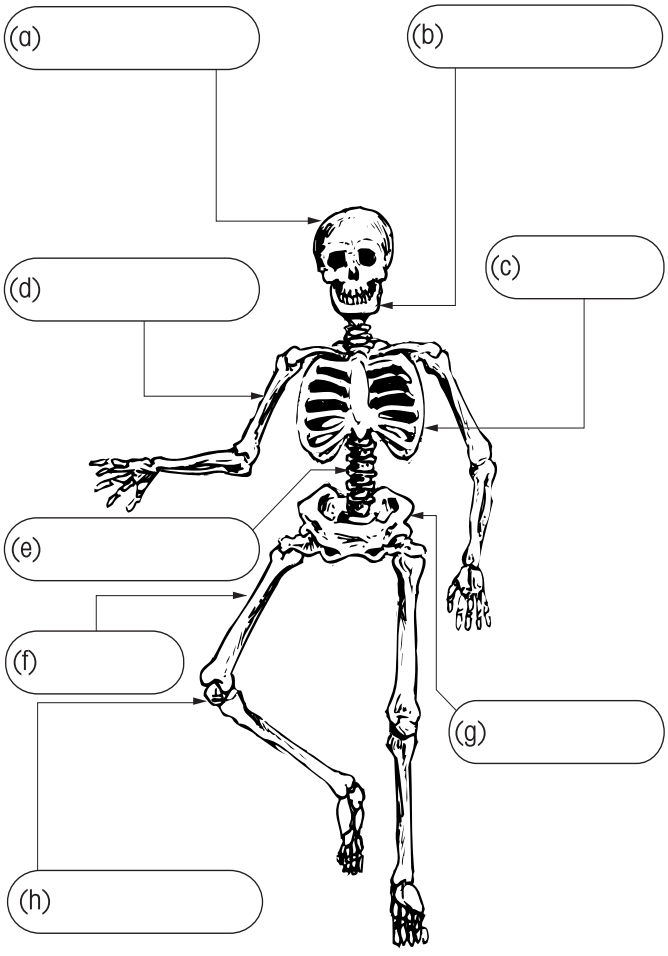
The Skeletal System

1 Our skeleton performs three main tasks. What are they?

- _____
- _____
- _____

2 Place these labels in their correct position on the diagram.

humerus	skull	kneecap
ribs	jawbone	femur
backbone	pelvis	



3 Our Muscles

A muscle is a collection of thread-like fibres, surrounded by a protective sheath.

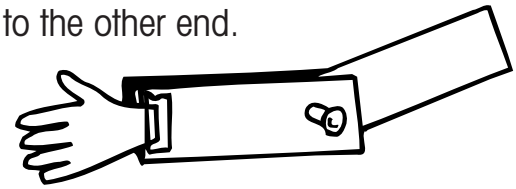
Use these materials to make a model arm.

- cardboard
- scissors
- adhesive tape
- split pin
- thick string

(a) Cut two strips of cardboard – one twice as thick as the other. Fold the thicker one in half lengthways.

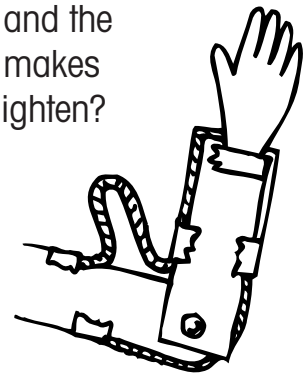
(b) Give the narrow strip a rounded end. Place the rounded end in the fold of the folded card and join with the split pin.

(c) Trace your hand onto card and join it to the other end.



(d) Cut two pieces of thick string. Tape a piece to each side of the arm.

(e) Now pull one of the strings then the other. The arm should move. Can you see that one string makes the arm bend and the other makes it straighten?



This model works just like the muscles in your arm!