

Short Term Planning

Science

Year 4 Term 2

Topic 4A

Moving and Growing Session 1

Main focus and Objectives	<p>Children will realise that the function of the skeleton is threefold: It enables us (together with the muscles) to move, It gives the body shape and support and it provides protection for the internal organs. They will be able to locate some of the more common bones on their own bodies or on a skeleton. (or other representation)</p>
Procedure and teaching points	<p>Begin by establishing what prior knowledge children have about the bones and the skeleton of the human body. Discuss the reasons for having a skeleton and compare with invertebrates. See if they can agree on how many ribs they have. Ask children to draw what they think a particular bone would look like. (for example A femur or a rib) Ask them to draw a basic skeleton showing ribs, spine, skull.</p> <p>On a model skeleton, an OHP of a skeleton or on a child, ask children to come out and show where they think the skeleton's main components can be found.</p> <p>Teach children that the muscles work together with the bones and skeleton, enabling us to move. Demonstrate this with the muscles in the upperarm. Show how the biceps and triceps work in opposition and that one muscle is contracted whilst the other is relaxed. (can show this by attempting to lift a table then by pushing down on the table and feeling the muscles)</p> <p>Look at some pictures, x-ray photographs and diagrams of human bones and compare with the skeletons of other animals. Are there similarities between skeletons?</p>
Resources	<p>Skeleton model, bones, drawings and OHP of a skeleton. Copies of Letts Y3/4 Science P18,19</p>
Vocabulary	<p>Skeleton, muscles, rib, thigh, spine, femur, skull. Vertebrate.</p>

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Topic 4A Moving and Growing Session 2

Main focus and Objectives	Children will be able to name the major bones in the skeleton and appreciate that bones are moved by the contraction or the relaxation of muscles. They will recall that a hinge joint allows only uni-lateral movement whereas a ball and socket joint enables omni-directional movement. Most children will be able to identify which joints are lever and which are b+s.
Procedure and teaching points	<p>Begin by reviewing the major bones. Ask a child to volunteer to come out, point to various parts of the body. Children respond by naming the bones. (It would be useful for future science for children to be able to locate the positions of some organs such as the kidneys, heart etc)</p> <p>Point out the need for the skeleton to be flexible. (The ribcage needs to be able to rise as the lungs inflate) The bones need to very strong but light and not brittle. That the bones are hollow to give this lightness. Point out the need to have plentiful calcium in the diet and the illness of calcium deficiency and brittle bones.</p> <p>It may be possible at this point to demonstrate the relative strength of hollow and solid structures in order that children realise that some strength has to be forfeited in order to keep the weight down. Load equal diameter rod and pipe/tube to test strength.</p> <p>Look at x-ray photographs of broken bones and discuss the way that broken bones do (under the right circumstances and within reason) repair themselves.</p>
Resources	X-ray images of broken human bones, showing simple and complicated fractures. Samples of bones.
Vocabulary	Skeleton, muscles, rib, thigh, spine, femur, skull, hollow, fracture, bone marrow,

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Topic 4A Moving and Growing Session 3

Main focus and Objectives	Children will be able to identify a feature of the body or skeleton and turn it into a form that can be investigated. They should be able to decide what measurements to make and how to make them. Be able to decide upon a way of recording and representing the data they aim to collect.
Procedure and teaching points	<p>Begin by asking children about the differences which might exist between themselves and adults or infants or between genders. See if they can suggest possible ways of investigating these differences. Help them to turn these differences into an investigatable form. Steer less able children towards realistically achievable or measurable differences eg.</p> <p><i>Who has the longest arms, women or men, boys or girls?</i> <i>Are adult's heads bigger than children's heads?</i> <i>Do year 6 children have longer arms than year 4 children?</i></p> <p>Having chosen a variable to investigate, the groups should make a prediction and discuss and plan a fair test Help children to decide on the best (most accurate and dependable) method of measuring. eg some children may suggest trying to measure head width instead of circumference.</p> <p>A group may want to measure the forearms of the adults in the school and compare that with Y6 children. The results could be shown graphically (column graph or pictogram) or by calculating the average.</p> <p>The children should write a brief account of what they did, with diagrams where appropriate and draw a meaningful conclusion.</p>
Resources	Rulers, tape measures, prepared results nets, glue sticks
Vocabulary	Identify, measure, investigate, prediction, conclusion, record, comparisons, evidence

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Topic 4A Moving and Growing Session 4

Main focus and Objectives	Children will be able to explain the difference between vertebrates and invertebrates and be able to give examples from both groups.
Procedure and teaching points	<p>Children will already be aware of the three main functions of the skeleton. (support, protection, movement.) Explain that all animals need to have support for their bodies and that this is achieved by the skeleton in vertebrates. Some animals do not have an internal skeleton to do this. Some animals have a fluid within a membrane or skin and this provides a degree of support, even though the bodies are not rigid. Examples of this include slugs, earthworms, jellyfish etc. These animals are called invertebrates.</p> <p>Discuss other types of animals like those with exoskeletons for example the crab, lobster, beetle etc. Ask children why they think that these creatures have skeletons on the outside rather than within their bodies.</p> <p>Give children a note on vertebrates and invertebrates and give a few examples (allow children to suggest) of each.</p> <p>Use books or CD ROMs to find pictures of invertebrate animals as source material to find out and write about how bodies without bony skeletons are supported. Children can draw examples of both types of animal.</p>
Resources	Animal books and encyclopædia CD ROM. A collection of invertebrate animals or photographs to observe.
Vocabulary	Vertebrate, Invertebrate, exoskeleton,

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Topic 4A Moving and Growing Session 5

Main focus and Objectives	<p>Children will be able to explain how muscles contract and relax and how this movement controls how our limbs are made to move. Children will understand that muscles are anchored to the bones. They should also understand that exercise can tone muscle and increase the strength.</p>
Procedure and teaching points	<p>Demonstrate by drawings or by the use of a model how the biceps and triceps muscles in the upper arm, control the movement of the lower arm. That when the biceps contract and the triceps relax, the arm is raised and when the biceps relax and the triceps contract, the arm is lowered. (Can use two pieces of card, hinged with a paper clip. An elastic band, one on either side of the pivot are secured to each "bone" to represent the biceps and triceps. Arrange the elastic bands such that when one is taught, the other is slack.)</p> <p>Remind children of the earlier demonstration using the closed fist and the tables in the classroom.</p> <ol style="list-style-type: none">1. Place fist on top of table and push down. Feel the biceps (stiff and contracted) and the triceps (loose and relaxed) Push up with the fist and feel the muscles again. (Now the muscle tension is reversed) <p>If time is available, allow children to make a model upper arm.</p>
Resources	<p>A model of the upper arm (as above)</p>
Vocabulary	<p>Biceps, triceps, relax, contract, muscle tone.</p>

Investigating Materials.

Try to assemble the following samples for children to test.

Glass objects such a bowls or plates
Perspex sheet
Plastic wallets
Protractors (large)
Sellotape
Tracing paper and normal A4 paper
Plastic jugs
Thin card and thick card
Pieces of bin bag plastics
Felt squares
Mirrors
Hardboard or thin MDF
Plastic 2D Maths shapes
Fabric
Coloured plastic CD cases
Plastic rulers white and clear

