Unit 5A Keeping healthy

Science Y5
Mr Jennings' class

ABOUT THE UNIT

This unit helps children to learn that there are many aspects to keeping healthy. Children learn about the heart and how heart beat is affected by exercise and relate this to what they already know about movement and exercise.

Experimental and investigative work focuses on:

- repeating measurements
- representing data in bar charts and graphs, and interpreting these
- using results to draw conclusions.

Work in this unit also offers opportunities for children to find out how early scientific ideas about diet and health were tested. It helps them to use knowledge and understanding of science to explain and interpret phenomena related to their personal health. Teaching about tobacco, alcohol and other drugs is likely to be undertaken in relation to the school's education programme for personal, social and health education.

This unit takes approximately 10 hours.

WHERE THE UNIT FITS IN

Builds on Unit 3A 'Teeth and eating' and Unit 4A 'Moving and growing'

Children need:

- to recognise some common food types
- to understand that a balanced diet is important for health.

Links with Units 2D, 3C and 5C, personal, social and health education and physical education.

VOCABULARY

In this unit children will have opportunities to use:

- words and phrases related to health *eg balanced diet, side effect*
- words related to food types *eg fats, sugars, starches*
- words and phrases related to the heart and circulation *eg heart beat, pulse, pulse rate, muscle, blood vessel, lung*
- expressions for making suggestions using 'if', 'could'.

RESOURCES

- secondary sources *eg reference books, CD-ROMs, the internet, leaflets about food from supermarkets, health centres and pharmacies, food labels*
- timing devices with an appropriate degree of accuracy (seconds not hundredths of seconds), digital pulse meters
- sources of information about drugs *eg local health education authority*
- balloon pump or bicycle pump
- video/other secondary sources illustrating the function of the heart
- spreadsheet, graphing and DTP software

EXPECTATIONS

at the end of this unit

most children will:	identify the components of a healthy and varied diet and describe how an idea about the effect of diet on health was tested; recognise some harmful effects of drugs; recognise that during exercise the heart beats faster to take blood more rapidly to the muscles; make careful measurements of pulse rate, represent these in suitable graphs and explain what the graphs show
some children will not have made so much progress and will:	identify some foods needed for a healthy and varied diet and some harmful effects of drugs; recognise that pulse rate is a measure of how fast the heart is beating and make measurements of pulse rate
some children will have progressed further and will also:	explain some early evidence for the effect of diet on health; explain why repeated measurements of pulse rate should be made and why it is important to test the effects of exercise on the pulse rate of several people

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES	POINTS TO NOTE
	Review work on growth and diet, through discussion *eg using a true/false quiz* of children's ideas about a balanced diet and explanation of why diet is important in terms of activity, growth and staying healthy.		Teachers will need to take into account in their short-term planning what this introductory activity shows about children's understanding of diet and health. Teachers will be aware of the need to be sensitive to individual children and to their families in terms of health and other circumstances and in terms of not worrying children about their body image.
CHILDREN SHOULD LEARN		CHILDREN	
• how a scientific idea can be tested and the evidence used to support the idea	♦ Tell children a story about inadequate diets *eg sailors developing scurvy on Tudor sailing ships (c.f. last year's history topic)* and explain how this puzzled doctors at the time and how they thought of explanations and tested them.	• describe how an imaginative idea about the relationship of diet to health was tested	Sailors' diets were deficient in vitamin C. Although doctors did not know about vitamins it was suggested that the lack of fresh fruit and vegetables was the cause of the problem. This idea was tested by giving some sailors limes.
	♦ Ask children to bring in food packets/labels for next lesson's activities.		

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LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• that to stay healthy we need an adequate and varied diet • to present information about diet and health	♦ Help children to use secondary sources *eg food packets/labels they have brought in, reference books, CD-ROMs, leaflets from supermarkets, health centres and pharmacies* to find out about foods which are rich in fats/oils, those which are rich in sugars/starch and those which provide materials needed for growth. ♦ Discuss with children why fruit and vegetables are also important for a healthy diet and possible effects of too much fat and sugar. ♦ Help children to produce a leaflet/poster or menu illustrating adequate and varied diets or a week's menus which provide a varied and balanced diet.	• identify *eg by including them in their leaflet/poster or menu* foods *eg meat, fish, eggs, cheese* needed for growth and those which provide for activity *eg sugar, bread, pasta, rice, fats etc* • identify some foods *eg by including them in their leaflet/poster or menu* which contain large amounts of fat *eg crisps, chips* and some which contain large amounts of sugars *eg sweets, jam* and state that they shouldn't eat too much of these • identify fruit and vegetables *eg by including them in their leaflet/poster or menu* as essential components of a healthy diet	At this stage children do not need to be able to classify foods formally into groups such as protein or carbohydrate. However, they should know that some foods *eg fish, meat, cheese and some vegetables* provide materials necessary for healthy growth while other foods *eg starches and sugars* are more immediate sources of energy for activity, and that fruit and vegetables provide other essentials *eg fibre.* Most children should be able to understand that energy foods are of two types – carbohydrates (starches and sugars) and fats. This activity could provide an opportunity to construct or use an ICT database relating to food types. This activity links to work on information retrieval and reinforces work on using explanatory and non-chronological texts. This is included in the National Literacy Strategy Framework for teaching for year 5.

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• that we need exercise to stay healthy and to maintain our muscles • that when we exercise, our muscles work harder	♦ Ask children to reflect on what is happening to their bodies during PE activities (during and after playing games or doing other strenuous exercise) *eg we breathe faster, feel hotter, feel tired* and what happens after a short rest. ♦ Revise what we (animals) need to stay alive. ♦ In class describe and explain in terms of the muscles working what happens during and after playing games or doing other strenuous exercise *eg we breathe faster, feel hotter, feel tired* and what happens after a short rest. ♦ muscles question sheet	• explain after exercise we feel *eg hotter, tired* because our muscles have worked harder • explain that oxygen is one of the things that people (and animals) need to stay alive	Lungs and breathing are not part of the programme of study at key stage 2. However, some children will know that exercise has an effect on pulse rate and on the rate at which they breathe, because of the need for more oxygen to be carried to the exercising muscles.
• that the heart and lungs are protected by the ribs • that the muscle in the walls of the heart contracts regularly, pumping blood around the body • that blood vessels carry blood around the body	♦ Using models or other secondary sources, locate the heart and lungs within the rib cage. ♦ Show children a model of a heart to show size, vessels and thickness of the walls. ♦ Using secondary sources *eg video, CD-ROM* explain that the muscle in the walls of the heart contracts regularly, pumping blood around the body. ♦ Demonstrate a pump *eg a balloon pump* and emphasise it is used to push air into the balloon. ♦ Using models or video demonstrate to children that the heart pumps the blood to all parts of the body where it is needed *eg muscles, brain, lungs.* ♦ heart and circulation question sheet	• locate the heart *eg in a model 3D representation of the body* and describe how the ribs protect it • recognise that the heart is a pump because its muscle wall keeps contracting and squeezes the blood in it forcing blood to move around the body • describe *eg through making annotated drawings* that the heart pumps blood round the body and identify some parts of the body *eg lungs, brains, muscles* through which blood flows	Children sometimes think that blood only reaches some parts of the body. At this stage it is not necessary to discuss the detailed structure of the heart, *eg the structure and function of valves* or of the blood *eg cells* or that there are different types of blood vessel. Teachers may wish to discuss the role of the blood in transferring oxygen from the lungs to muscles and other parts of the body. However, this is not a requirement of the key stage 2 programme of study.

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LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• how to measure their pulse rate and relate it to heart beat • to repeat measurements of pulse rate • to represent data about resting pulse rate in a bar chart and to say what this shows	♦ Ask children about the relationship between heart beat and pulse. ♦ Explain to children that pulse rate is measured as beats per unit time (minute). ♦ Show children how to measure resting pulse rate and ask them to take and record their own several times. ♦ Ask children to suggest why they didn't get the same result each time and why it is important to make several measurements. Ask them to contribute the result they think is most accurate to a class record of resting pulse rate. ♦ Help children to convert this into a bar chart where data is grouped. Ask children questions about the bar chart *eg* – *Which was the most common range for pulse rate?* – *What were the highest and lowest pulse rates?* – *Were these very common?*	• describe the connection between pulse rate and heart beat *eg the pulse rate tells you how many times the heart beats in a minute* • measure their resting pulse rate several times obtaining reasonably consistent results • with help, represent data about pulse rate in a bar chart and interpret what this shows	Children may focus on other effects of exercise *eg feeling hotter.* Teachers may need to re-direct their attention to the connection between exercise and increased pulse rate. A graphing program or spreadsheet could be used to construct a bar chart.

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• to identify factors which could affect pulse rate and make predictions about the changes • to plan what evidence to collect including the number of measurements of pulse rate to take and the number of children to use • to present results in a line graph and explain what these show and whether they support the prediction	♦ Ask children to speculate about factors which could change the pulse rate *eg exercise* and to make a prediction *eg if I run for two minutes it will increase my pulse rate, if I run for three minutes it will increase more and take longer to get back to normal* and to investigate the relationship between exercise and pulse rate. ♦ Discuss with children what sort of exercise they think raises pulse rate most and why it is important to investigate the effect on several children, not just one. ♦ Ask children to plan an investigation to show that the more vigorous the exercise, the higher the pulse rate *(most able pupils also to measure and then compare with breathing rate.)* ♦ After children have carried out their investigation help them to represent their data as a line graph. ♦ Talk with children about what their graph shows and, if possible, show them other graphs or data relating to changes in pulse rate and ask them to interpret these. ♦ Ask children to think of additional questions *eg would we have got the same results if we'd used adults instead of children? boys as well as girls?* and to review their conclusions in the light of these questions.	• plan an investigation to test the prediction • make suitable measurements of pulse rate *eg by carrying out the process on several children* • construct a line graph to show the effects of exercise on pulse rate *eg pulse rate before and at intervals after exercise or pulse rate before and after exercise of different duration and describe what these show* • explain how exercise affects the heart beat in terms of the exercising muscles needing a better supply of blood • describe some limitations of their work, *eg I only tested girls, I think it would be the same for everybody but I don't really know*	This activity offers children the opportunity to carry out a whole investigation. It may be helpful to concentrate on the aspects of investigation highlighted in the learning objectives. Children could be asked to interpret line graphs showing changes in pulse rate during and after exercise. **SAFETY** – Children should undertake usual PE activities, not attempt to 'test' their stamina or strength. Careful supervision is needed to ensure this.

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• that when humans exercise, muscles move parts of the skeleton and this activity requires an increased blood supply, so the heart beat increases and the pulse rate is faster	♦ Discuss with children which muscles they move when they exercise *eg running, jogging, swimming* and relate this to how muscles move their skeletons. ♦ Review previous work on skeleton, muscles and exercise by asking children to produce an information leaflet about a form of exercise.	• identify in their leaflet the parts of the skeleton that move and which parts of the body need an improved blood supply *eg when you swim you move your arms, shoulders and legs and the heart pumps faster to increase the supply to the muscles in these parts of the body*	
	SECTION TO BE DEFERRED UNTIL DARE LESSONS		
• that substances like tobacco, alcohol and other drugs can affect the way the body functions and these effects can be harmful • that medicines are also drugs and also affect the way the body functions but the effects are usually beneficial though there may be side effects • that medicines can be harmful if they are not taken according to instructions	♦ Review what children know and understand from the previous key stage unit 'Health and growth' (Unit 2A). ♦ Explain the definition of a drug as any substance which changes our physical or mental state and talk with children about possible side effects. Encourage children to think about why we take medicines even though there may be unpleasant side effects. ♦ Use secondary sources *eg video, CD-ROM, leaflets* to illustrate effects of tobacco, alcohol or other drugs. Ask children to make posters to inform other children of the effects of drugs, alcohol and tobacco.	• include in their poster appropriate information about the effects of drugs, tobacco or alcohol	Teachers will be aware of the need to be sensitive to individual children and to the circumstances of their families in relation to this area of work. A DTP program could be used to produce the poster. **SAFETY** – Tar is carcinogenic. Demonstrations of 'smoking machines' which produce tar are not suitable for most primary classrooms.