Year 6 Science
Unit 6B Micro-organisms (short unit)

ABOUT THE UNIT

Through this unit children learn that there are many very small organisms called micro-organisms which feed, grow and reproduce and which may be harmful or beneficial.

Experimental and investigative work focuses on:

- making observations
- drawing conclusions
- suggesting explanations for conclusions, using scientific knowledge and understanding.

Work in this unit also offers children the opportunity to use scientific ideas to explain some causes of illness and decay, to relate micro-organisms to food production and to relate science to their personal health.

Some of the work in this unit is likely to be undertaken in relation to the school's programme for personal, social and health education.

This unit takes approximately 6 hours.

WHERE THE UNIT FITS IN

Builds on Unit 3A 'Teeth and eating' and Unit 6A 'Interdependence and adaptation'

Children need:

- to know living things feed, grow and reproduce.

Links with Units 5A, 5B and history.

VOCABULARY

In this unit children will have opportunities to:

- use alternative terms for micro-organisms *eg microbe, germ, virus*
- recognise that some of these terms *eg germ* are used in an everyday but not a scientific context
- provide explanations and generalisations.

RESOURCES

- secondary sources providing information about micro-organisms *eg video, CD-ROM showing decay within a compost heap*
- live yeast, dough
- sealed bag of grass cuttings
- pictures, packaging of foods the production of which involves micro-organisms
- mouldy food *eg fruit, bread*

EXPECTATIONS

at the end of this unit

most children will:	recognise that there are many very small organisms which can cause illness or decay or which can be used in food production and that these micro-organisms feed, grow and reproduce like other organisms
some children will not have made so much progress and will:	recognise that very small living things can cause illness
some children will have progressed further and will also:	describe evidence that yeast is living; explain how micro-organisms can move from one food source to another and how this can cause food poisoning

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LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• that there are very small organisms called micro-organisms which can be harmful • that scientific ideas about diseases are based on evidence	1. Introduction – causes of illness. Introduce topic by finding out children's ideas about what makes them ill. Follow up children's ideas by discussing some ideas people used to have about illness. Ask children to use secondary sources *eg CD-ROMs, reference books* to find out about scientists *eg Jenner, Pasteur* and others who developed the 'germ' theory of diseases. Explain that 'germ' is an everyday term for the very small living organisms called micro-organisms which cause disease. Dev Sc. Y6 p. 23 Letts Sc. Activity Book p 24 - 25	• recognise that diseases can be passed on by very small organisms and that this idea is based on scientific evidence	Teachers will be aware of the need to be sensitive to individual children and their families in terms of health. This activity may show that children do not distinguish between illnesses known to arise from infection and other illnesses. Teachers will need to bear this in mind during their short-term planning for later activities. Children will have heard about viruses. It may be helpful to mention three common types of micro-organisms: viruses, bacteria and some fungi. Children would not be expected to recall these names. Children should also be told that 'microbe' is a term which is sometimes used instead of 'micro-organisms'.
• to consider the reasons for some common illnesses • that some micro-organisms can cause common illnesses	2. Harmful micro-organisms Invite a health professional to visit and ask children to pose questions about illnesses *eg stomach upsets, spots, measles and rubella.* Talk with children about questions and answer these in terms of micro-organisms. Remind children of tooth decay and the need to keep gums healthy and ask them about ways of preventing decay. Explain this in terms of removing harmful micro-organisms from the mouth. Belair Lesson 1 KS2 Sc. Data Interpret. p 108 - 109	• identify some illnesses *eg rubella, chicken pox* and some conditions *eg boils, tooth decay* caused by micro-organisms • explain why cleaning teeth regularly helps prevent tooth decay and gum disease	**SAFETY** – Any work on micro-organisms must use only safe sources *eg yeast, moulds on bread or cheese.* For details see 'Be Safe' section 11. Cultures should NOT be grown on special media ie agar plates.

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LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• that micro-organisms are often too small to be seen • to make suggestions about observing food, bearing in mind the need for safety • that micro-organisms can cause food to decay • that food needs to be handled and stored with care	**3. Micro-organisms and food decay.** Show children some examples of mouldy food *eg bread, apples and cheese* and ask children what has caused the decay. Ask children to suggest where sealed containers of food might be left and to observe them over two weeks. Discuss the effects of eating mouldy food and ask children to suggest how they prevent food becoming mouldy at home. Talk with children about basic aspects of food hygiene *eg using different knives for cooked and raw meat, cooking food thoroughly, organising a fridge to keep cooked and raw food apart* and ask them to write some simple hygiene rules and an explanation of the need for each rule. Dev Sc. Y6 p. 24-25 Letts Sc. Activity Book p 46, 48 KS2 Sc. Data Interpret. p 112 - 113	• recognise that micro-organisms cause food to decay • explain that micro-organisms grow and reproduce on food and that this can cause food poisoning	**SAFETY** – Moulds are visible. However, other micro-organisms which cause food to go bad *eg bacteria* may not be. Since many micro-organisms release large quantities of spores into the air and some people are allergic to these, mouldy foods should be kept in closed plastic bags or other closed containers. See 'Be Safe' section 11.
• that micro-organisms bring about decay • that decay can be beneficial • that micro-organisms which cause decay are living organisms	**4. Micro-organisms and natural decay.** Walk around the school grounds or locality to look for evidence of natural materials *eg leaf litter, grass cuttings* which are decaying. Contrast with other waste material *eg some plastics* which do not decay. Use secondary sources *eg videos, CD-ROMs* to show a time-lapse sequence of decay *eg within a compost heap* or set up a bag of *eg vegetables, leaves, grass cuttings* and observe it over a period *eg one to two weeks.* Ask children to consider why decay is beneficial and what evidence they have that the micro-organisms causing decay are living. Dev Sc. Y6 p. 26 Letts Sc. Activity Book p 46 – 47 KS2 Sc. Data Interpret. p 106 – 107 ?	• identify some things *eg leaves, grass, paper* which decay • describe consequences if materials did not decay *eg if things didn't rot, rubbish would pile up forever* • explain that micro-organisms grow and that they 'feed' on the material, causing it to decay	Biodegradable plastics are synthesised so that they do decay. Micro-organisms break down materials to release nutrients back into soil and water and in this way they are recycled. These are sometimes referred to as 'decomposers'. **SAFETY** – Grass cuttings, leaves etc should be contained within a loosely sealed bag *eg a polythene bag sealed with a 'tie'* which allows gases to escape. The bag should be disposed of without opening.

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LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
• that micro-organisms feed and grow • to make suggestions about what yeast needs to grow • to make careful observations and compare these in order to draw conclusions about the effect of yeast on dough • to explain conclusions using scientific knowledge and understanding	5. Useful micro-organisms. Show children some live yeast and explore bread making *eg dough with and without yeast.* Discuss what happens and explain that as the yeast grows it produces a gas which makes the bread rise. Explain that yeast is a micro-organism which means it lives, grows and reproduces. Ask children to suggest what is needed to keep it alive. Set up tests *eg yeast with and without sugar (food) and in warm and cold places* and observe the gas produced. Ask children whether the results support the idea that yeast is living. Belair Lesson 2 Dev Sc. Y6 p. 27, 49 KS2 Sc. Data Interpret. p 114 - 115	• describe that bread rises when it contains yeast but without yeast, dough does not rise • describe that when yeast has sugar and is kept in a warm place it produces bubbles of gas but without sugar very little gas is produced • explain that yeast needs sugar and warmth to grow which supports the idea that it is living	Fresh yeast is available from many health food shops. Additional time may be needed to allow the dough to rise. Micro-organisms grow, feed and reproduce. However, they are not classified either as plants or as animals but in other kingdoms *eg yeast is classified as a fungus.* **SAFETY** – Children should not be allowed to taste sugar, dough or bread unless strict hygiene has been observed. **SAFETY** – Containers of yeast must not be completely sealed.
• that micro-organisms are useful in food production	6. Micro-organisms & food production. Ask children to use secondary sources to identify other uses of micro-organisms in food production *eg yoghurt, cheese, blue cheese.* Make a display or collage to illustrate this. KS2 Sc. Data Interpret. p 110 - 111 + Belair Test 6B for school records.	• identify examples of the use of micro-organisms in the production of food	

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