



Micro-organisms - Year 6

Overview: To learn that very small organisms called micro-organisms feed, grow and reproduce and can be harmful or beneficial (unit 6b).

Micro-organisms

Aims:

- To recognise that there are very small organisms everywhere.
- To reinforce that living things feed, grow and reproduce.
- To offer an opportunity to use scientific resources to explore the world of microbes. Scientific ideas are based on evidence.

Time: 60 min

Resources:

- Pictures of micro-organisms,
- Household pictures
- Goggles, Lab coats, Gloves, Petri dishes, Microscopes,
- Overhead Projection equipment (see notes)

Skills:

- Observation
- Reasoning
- Justification

Keywords:

- Microbe, Germ, Virus, Bacteria, Yeast, Fungi

Cross-Curricular Subjects:

- Science – *Units 5A, 5B & 6B*
- Art – *Unit 2A*
- Literacy – *Units 2 & 3*
- ICT – *Unit 2E*

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Teaching sequence:

- Welcome and short presentation about Syngenta and what the company does in working with plants
- What is a micro-organism and microbe? – Define each word:
 - *micro- very small*
 - *organism – something that is living*
 - *microbe – one very small living organism*
- **Are Microbes Friend or Foe?** - PowerPoint presentation
- (Slides 1 2,3,4 & 5) - Go through the various slides that illustrate different microbes such as viruses, bacteria, yeast and fungi.
- Discuss each microbe and give examples how these micro-organisms effect their every day lives.
- (Slide 6) - Bad microbes - discuss the relevance of bad microbes in the form of diseases.
- (Slide 7) - Talk to the pupils about how scientists study the growth of microbes in a controlled environment.
- Discuss the health and safety aspects of working with microbes. Ask the pupils what a scientist would need to wear when working with any kinds of micro-organisms. What would happen if conditions were not controlled and microbes spread? Describe what scientists do at Syngenta

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Working as Scientists:

- Kit out the class in lab coats and goggles (and gloves, if necessary). Quiz the pupils again about the importance of wearing protective clothing, as discussed earlier in the lesson. Once they are all in their protective clothing tell them that they are going to work with a range of microbes and study them closely under microscopes.
- Take pupils into the labs.
- Teacher to have petri dishes ready with interesting examples of good and bad microbes. Have as many different examples for pupils to look at under microscopes. Ask the pupils why the samples have been put in covered jars? Discuss with them that some microbes produce spores and these could infect other samples.
- Teacher to demonstrate how a scientist would prepare a sample to analyse under a microscope and stress the importance of how careful they must be.
- Select a pupil (or more, depending on space and the class) to help prepare a simple sample. Get pupils to extract a piece of decayed food, or other rotting material from one container onto a petri dish or glass slide, by using appropriate tools. This sample will be looked at under the microscope.
- Before the pupils use the microscopes, check that they know how to work the equipment. Carefully explain the safety aspects of working in the lab and check that everyone understands the importance of their actions.

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- Ask the pupils to be scientific in their approach to looking at each sample. Ask them to decide what the sample might be – good or bad – and justify their reasoning. Can they recognise any micro-organisms from pictures they have seen earlier– fungi, bacteria, yeast or virus? Can they describe what the microbe looks like so that other scientists would recognise the microbe/s if they saw them for the first time.
- *Note:* if there are not enough microscopes the teacher could use a projected image of the microbe up on an overhead screen and ask the pupils to work in small groups and come up with appropriate answers to the questions.
- All pupils should have the opportunity to look at all samples under the microscope. Teacher will need to organise into groups, appropriate to how many microscopes are available.
- Bring the pupils back together to present their findings. Begin by asking the groups about their observations on each sample and then tell them what the microbe actually is. Teacher to give a brief description about what the microbe needs to feed on, to grow and reproduce. NOTE: It is important to point that there are microbes that cause decay - without these microbes we would have even more rubbish around than we do.

Reproduction:

- Show the pupils examples of how a micro-organism reproduces. Where possible, have a series of covered dishes for the pupils to look at, that show the organism in varying stages of reproduction. Alternatively, show a simple chart of how microbes multiply.

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- Get the pupils to describe what observations they have made about the microbe's development and simply explain how they think this change happened.

Our homes (Plenary):

- Teacher to show picture/s of a household room/s and equipment e.g. the kitchen, bathroom, toilet, fridge, etc. Discuss where the good and bad microbes are in their homes and highlight the importance of keeping everything clean and tidy. It is important to stress that there are micro-organisms everywhere and our lives are full of them – friend and foe.

Teachers Notes:

- Syngenta teacher will need either Power Point presentation or laminated sheets to highlight what the company does, what kind of people work in the organisation and how do they work with plants and help them to grow. Syngenta also help farmers around the world to grow their crops so that they can grow food, flowers and other important things for us to eat and use.
- Teacher to use PowerPoint presentation (or pictures) to introduce the lesson about micro-organisms – 6-7 slides
- Wear appropriate kit – lab coat so that you can use this 'as a prop' to talk about the importance of health and safety of a scientist when working with living organisms.
- Teacher will need to have enough lab coats, goggles, gloves for all the pupils, teachers and parents to wear.

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- Teacher to have a piece of mouldy food ready for a few pupils to prepare. Have petri dishes or glass slides, and suitable tools to make up a sample to be looked at under the microscope.
- Before the lesson, teacher to have a good range of microbe samples ready. Use examples of good and bad microbes and if possible, choose microbe samples that are relevant to their everyday lives.
- Colourful pictures of other microbes, retrieved from the company's photographic archives would be useful to show the pupils. Also pictures of different household rooms and equipment that can be used for discussion.

Extension Activities:

- Walk around the school grounds or locality to look for evidence of natural materials *e.g. leaf litter, grass cuttings* which are decaying. Contrast with other waste material *e.g. some plastics* which do not decay. Use secondary sources *e.g. videos, CD-ROMs* to show a time-lapse sequence of decay *e.g. within a compost heap* or set up a bag of *e.g. vegetables, leaves, grass cuttings* and observe it over a period *e.g. one to two weeks*. Ask pupils to consider why decay is beneficial and what evidence they have that the micro-organisms causing decay are living.
- Conduct a project on how you can keep healthy and stop infections and illnesses.
- Walk around the school or local grounds and look for natural materials which are decaying. Prepare a poster on the importance of recycling.

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- Pupils to log onto website below and play quiz and see if they can spot
- and place where the micro – organisms are at work.
- http://www.bbc.co.uk/schools/ks2bitesize/science/activities/micro_organisms.shtml