

Introduction to Microbes and Antibiotic Use



Foundation/Reception Lesson Plan

- Foundation/Reception Lesson Plans covering five lessons
- Templates for activities
- Additional resources
- Activities and outcomes link to the Australian Curriculum (Version 8.4)

Unit: Introduction to microbes and antibiotic use

Year level: Foundation/Reception

Lessons: 5

Links to Australian curriculum: Science | Health and Physical Education (*see details below*)

Key Learning Outcomes

- Understand there are different types of microbes, including: bacteria, viruses and fungi and they differ in shape and size.
- Understand that whilst some microbes are useful some can be harmful and cause illness.
- Understand when and why we need to wash our hands plus learn the appropriate way how to clean hands.
- Understand microbes are found everywhere and most microbes are too small to be seen with our eyes.
- Understand that antibiotics are used to treat bacterial infections.
- Understand not all illnesses require antibiotics.

Australian Curriculum Outcomes

Learning Area	Learning Outcome(s)
Health and Physical Education	Personal, Social and Community Health / Contributing to healthy and active communities: Identify actions that promote health, safety and wellbeing (ACPPS006)
Science	Science as a Human Endeavour / Nature and development of science: Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE013) Science Inquiry Skills / Processing and analysing data and information: Engage in discussions about observations and represent ideas (AC SIS233) Science Inquiry Skills / Communication: Share observations and ideas (AC SIS012)

Introduction to Microbes and Antibiotic Use



Rationale

This lesson plan aligns with the Australian Science Curriculum. Understanding micro-organisms (microbes) is an important component of science education as microbes play an important role in the health of humans and animals. Harmful microbes such as viruses and certain types of bacteria can make us unwell. While doctors can prescribe a type of antimicrobial (antibiotics) to help prevent and treat bacterial infections, the overuse and misuse of antibiotics has meant that the bacteria are increasingly becoming resistant to antibiotics, which is a concern both now and for the future. Health and Physical Education streams such as 'Personal, social and community health' are relevant to this, as human behaviour plays a role in preventing and/or managing antimicrobial resistance. Understanding hygiene, how to prevent illness from infection, and how to properly use antibiotics are all important aspects of personal and community safety and wellbeing.

Resources

Activity resources:

- Mouldy bread experiment guide **Page 8**.
- Making Microbes guide **Page 9**.
- Microbes on hands template **Page 10**.

Teacher to provide:

- Material pom poms in different sizes
- Play dough
- Zip lock bags x 6 and 6 slices of white bread.

Additional Resources

- 'Tiny: The Invisible world of Microbes', by Nicola Davies (10min 19sec)
<https://www.youtube.com/watch?v=MwGmcz8YQn0>
- 'Awareness of Antimicrobial Resistance (AMR)' animation by Health Education England (1min 49sec)
<https://www.youtube.com/watch?v=oMnU6g2djm4>
- 'How Germs Spread – Explaining the science for kids' by Cincinnati Children's (2min 4sec)
<https://www.youtube.com/watch?v=YBGsoimPXZg>
- 'Me, Microbes and I'. <https://philipbunting.com/books/me-microbes-and-i/>
- [WHO hand washing guide](#)
- ['The relative size of particles'](#), on the Visual Capitalist. Design by Harrison Schell.
- [Educational Resources](#), SA Health

Introduction to Microbes and Antibiotic Use



Lesson Outline

Lesson 1: Making Microbes

Overview

This activity aims to introduce students to different types of microbes and microbe shapes by allowing them to make a microbe out of play dough and experience the growth of mould on bread.

Pre lesson preparation: Prior to the lesson, allow mould to grow on a piece of bread at home (contained within a zip lock bag) to bring into class to show and discuss. Note: The students will grow their own mould in the lesson activity.

Discussion/Engagement

1. Show the class examples of what microbes look like. Some examples are viewable on the [‘Me, Microbes and I’ display pages on the Philip Bunting website.](#)
2. Read or watch the reading of the book ‘Tiny: The Invisible world of Microbes’, by Nicola Davies. Available here: <https://www.youtube.com/watch?v=MwGmcz8YQn0> (10 minutes and 19 seconds)
3. To give the students an idea of the size of bacteria and viruses compared to a grain of salt and human hair, show them this image [‘The relative size of particles’](#) via the Visual Capitalist by Harrison Schell.
4. Some microbes **are** big enough to be seen with your eyes. Show the class the slice of bread that you have allowed mould to grow on (keep it in the bag and dispose safely after). What can the students see? Tell the class they get to have a go growing mould next!

Activities

1. Mouldy bread experiment. * See **Page 8**. Review results one, two and three weeks later.
2. **Construct** a microbe * Refer to the Making Microbes template **on Page 9** for examples.

Post Activity Discussion

Ask the students which microbe they made and ask them to describe it. They can focus on the shape, colour and size as well as whether they have decided if it is good or bad microbe.

Introduction to Microbes and Antibiotic Use



Lesson 2: Hand Hygiene in prevention of the spread of infection (Part 1)

Overview

This lesson aims to help students understand that effective hand washing is important to minimise the risk of infection from potentially harmful microbes.

Discussion/Engagement

- Explain why hand washing is important.
- Explain when hands should be washed.

Hands should be washed:

- Before, during and after preparing food
- After using the toilet
- After exposure to animals or animal waste
- After coughing, sneezing or blowing your nose
- Before eating
- Before and after visiting ill people, for example in hospital or an aged care home.
- Hands should be washed for between 15-30 seconds, the same time it takes to sing "Happy Birthday" twice

Activities

1. **Watch:** 'How Germs Spread – Explaining the science for kids' by Cincinnati Children's <https://www.youtube.com/watch?v=YBGsoimPXZg> (2 minutes and 4 seconds)
2. Practice handwashing as per [WHO guide](#)
3. Check on the mouldy bread experiment. Can the students see mould?

Introduction to Microbes and Antibiotic Use



Lesson 3: Hand hygiene in prevention of the spread of infection (Part 2)

Overview

This lesson further aims to help students understand that effective hand washing is important to minimise the risk of infection from potentially harmful bacteria.

Discussion/Engagement

Remind students that:

- There are different types of microbes: viruses, bacteria and fungi
- Microbes are all different shapes and sizes, are everywhere yet most can't be seen
- Handwashing is important to minimise the risk of infection from potentially harmful microbes

Activity

Using the template on **Page 10**, provide students with coloured pom poms (or other materials) to highlight microbes that can be found on hands. Discuss with students why it is important to wash hands to remove these microbes.

Introduction to Microbes and Antibiotic Use



Lesson 4: Where else can we find microbes?

Overview

This lesson consolidates previous learning and teaches children that microbes can be found anywhere

Discussion / Engagement

Check on the mouldy bread experiment. Discuss with the class what they can see. Review template on **page 8** for questions to ask the class.

Activities

1. On a piece of paper, **draw** some of the places you would most likely find germs (Hint: toilet, door handles)
2. Go on a tour of the school and **identify** places where you could find them
3. **Discuss** as a class your findings

Introduction to Microbes and Antibiotic Use



Lesson 5: Why antibiotics are used, when they are used and why misuse is a problem.

Overview

Antibiotics are sometimes used to treat bacterial infections and should only be used if given by your doctor. Having green snot does not mean you need antibiotics! Using too many or not using the correct amount can lead to something called 'antimicrobial resistance'.

This is where the 'bugs' have changed or grown stronger and cannot be killed by the antibiotics. This means that the antibiotics may not work when you need them again.

Discussion/Engagement

Check on the mouldy bread experiment. Discuss with the class what they can see. Review template on **page 8** for details and questions to ask the class.

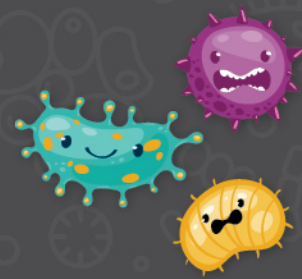
Additional question for the class:

What type of microbes can you see? (Answer: mould is a type of fungi).

Activities

1. **Watch:** Awareness of Antimicrobial Resistance (AMR) animation by Health Education England (1min 49sec): <https://www.youtube.com/watch?v=oMnU6g2djm4>
2. Antimicrobial Awareness Week is held in November each year. [Return to this link in October 2022 for activities and competitions.](#)

Introduction to Microbes and Antibiotic Use



Mould Growth Experiment

This experiment will show you how mould grows on a slice of bread.



You will need:

- 6 slices of white bread
- 6 zip lock bags
- Black marker



NOTE: *This experiment can be done as a class or in groups.*

Step 1. Students add the slices of white bread to the zip lock bags and label them with the group name and date.

Step 2. Place the bags in various locations in the class room. For example dark cupboard, in direct sunlight, warm spot etc. You could even get the teacher to put one in the staff fridge!

One week later:

Step 3. After one week look at the bread (do not remove from bags) and see what mould growth there is. Compare the differences and look at the size, shape and colour of the mould. What can you see?

Two and three weeks later: Repeat step 3. Have there been any changes? Has the mould grown more?

Question for class: What type of microbes can you see? (Answer: mould is a type of fungi).

Do not open the bags at the end of the experiment - discard safely.

Introduction to Microbes and Antibiotic Use



Make your own microbes



*What type of microbes have you made?
Bacteria, virus or fungi?
Are they harmful or useful microbes?*

Introduction to Microbes and Antibiotic Use



Name: _____

Add microbes to the hand

