

Microbes - Bacteria and their role in everyday life.

HOW DO THE FARMER AND THE DAIRY FACTORY LIMIT THE GROWTH OF BACTERIA?

ESSENTIAL QUESTION

When you say bacteria everywhere - what do you mean?

WHAT ARE WE LEARNING?

- Describe the organisation of life at a cellular level.
- Ask questions, find evidence and explore simple models.
- Investigate practices that limit the growth of harmful bacteria.

TRY THIS WITH

- Year 9-10
- Students who have an interest in practical application of their learning.
- Students who love using videos for learning.

FIND

- Restate
- Identify
- Rephrase
- Label
- Locate
- Classify

Understand that until recently bacteria was a mystery to the world.

Watch the introduction to bacteria and the Pyramid of Life to understand where bacteria fits into the order of Biological Organisation.

Collect virtual samples of bacteria online using Pinterest.

Watch the first section of the 'bacteria explained' video.

Identify the types of bacteria you have collected in your virtual sample.

Create a diagram of bacteria along with the video.

Use plain sweet biscuits and lollies to make model bacteria cookies.

Use Crash Course to discuss good vs. bad bacteria with a focus on Staphylococcus Aurea.

Watch 'You are your Microbes' - have students flip the video for each other to then complete.

Talk about exponential growth - what does that mean?



APPLY

- Question
- Relate
- Model
- Test for
- Select
- Establish

Predict the factors that would create an ideal environment for bacteria to thrive.

Consider: Temperature, Food and Environment etc.

Culture bacteria to test this theory.

Manipulate each sample with the identified variables to check your prediction.

Revisit bad bacteria - Staphylococcus Aureus.

Ask: Is it the bacteria in and of themselves that make us sick? If so how?

How do bodies respond to bad bacteria?

Brainstorm ways that we try to control the growth of bacteria. Prompt students to identify - refrigeration, disinfecting, sterilisation

Ask: How do white cells work?

Watch the white cells in action to see how true this is.

Review the SCC Levels case study - why do you think the Dairy Industry counts SCC levels and not the amount of the bacteria in the milk?



PRODUCE

- Model
- Conclude
- Construct
- Recommend
- Infer
- Deconstruct

Ask students to identify a Grass to Glass dairy supply chain.

Create a virtual representation in the classroom or visit a Dairy Farm of Factory.

Identify points in the chain where farmers and dairy companies attempt to control the growth of bacteria via refrigeration, disinfectant, sterilisation, etc.

If the level of the class allows: apply a historic lens and introduce factors such as the location of dairy factories, the invention of pasteurisation and of refrigerated transport.

Identify where in the chain the variables can be controlled.

Research public opinion about Raw Milk online and in social media.

Discuss the science behind some of the statements.

Explain that a new Milk Cooling Law will soon be put in place.

Introduce the latest invention: testing milk and cooling it as soon as it leaves the cow.



SUCCESS CRITERIA

Students can check they have successfully completed the task by:

- Flipping the 'You are your Microbes' Video for completion by a classmate.
- Investigating ideal environments for bacteria by culturing a sample.
- Creating a model of a dairy supply chain and identifying points of bacterial control.

PRINCIPLES	VALUES	KEY COMPETENCIES	LEARNING AREAS	WORD BANK	KEY CONCEPTS
Learning to learn Future Focus	Innovation Inquiry and curiosity Excellence Integrity	Thinking Participating and contributing	Science Mathematics and statistics	1. Pathogen 2. Staphylococcus Aureus 3. Microbe 4. Bacteriostatic	1. Bacteria 2. Microbes 3. Exponential Growth 4. Pathogens