Bacteria and Viruses

In this demonstration, students will not only learn what bacteria and viruses are, but also the importance of handwashing, the dangers of antibiotic resistance, and how easily a cold virus can spread between students. They will play a game to mimic how bacteria acquire antibiotic resistance, use Glo Germ cream to learn the importance of thorough handwashing, and simulate how the cold virus can be transmitted between students when personal objects, such as cups, are shared.

Grade-Specific Summary Table

This table provides a quick overview of which demo slides/activities match Alberta curriculum for each grade.

Grade	Curriculum Focus	Demo Activity	Slide/Activity Reference	Key Concept(s)
1	Living Systems: Microorganisms & Environments	Bacteria vs. Viruses intro Germ transfer demonstration Worksheet activities	- Bacteria/Virus intro - Germ transfer - Contamination ranking	- All living things (including microbes) depend on environments - Health and interdependence of organisms
4	Living Systems: Organism Structures & Functions	Bacteria characteristics Virus characteristics Immune system discussion	- Bacteria characteristics - Virus characteristics - Immune system	- External structures help organisms perform functions - Organisms sense and respond to environments for survival

Detailed Curriculum Links and Objectives by Grade

Grade 1: Living Systems - Microorganisms & Environments

Curriculum Link:

- All living things, including microbes, depend on specific environments to meet their needs. Bacteria and viruses play a role in the health and interdependence of humans, plants, and animals.
- Following instructions helps to keep people safe (Computer Science connection).

Objectives:

- Identify bacteria and viruses as living and non-living microorganisms.
- Recognize that microbes exist everywhere and require specific conditions to survive.
- Understand how germs spread and how to prevent transmission through proper hygiene.

Grade 4: Living Systems - Organism Structures & Functions

Curriculum Link:

- Different organisms, including microbes, have external structures that help them perform essential functions. Organisms sense and respond to their environments to ensure growth and survival.

Objectives:

- Compare external structures of bacteria (single-celled) and viruses (capsules of genetic material).
- Explain how microbes' sense and respond to environments (e.g., bacteria reproducing, viruses invading host cells).
- Relate organism structures to their functions in causing illness and spreading disease.
- Understand how the human body (immune system) senses and responds to pathogens.

Scientific Method Integration (All Grades)

Throughout the demonstration, volunteers model the scientific method:

- Hypothesis: Students predict contamination rankings and hand washing effectiveness
- Observation: Students observe Glo Germ, petri dishes, and contamination data
- Results: Data from contamination rankings and mask effectiveness studies
- Conclusion: Discussion of findings about germ transmission and prevention

Activity-Based Summary Table

Demo Activity	Slides	Alberta Curriculum Outcome	Key Concepts
Bacteria vs. Viruses Introduction	4-14	Living systems: microorganisms, structures & functions	Living vs. non-living, characteristics, illness types
Antibiotics & Vaccines	17-20	Organism response, health literacy	Treatment, prevention, antibiotic resistance
Contamination Ranking	26-30	Scientific method, data analysis	Hypothesis, observation, conclusion
Germ Transfer & Protection	23-37	Following instructions, organism response	Immune system, masks, social distancing
Hand Washing Experiment	41-42	Following instructions for safety	Proper hygiene, step-by-step procedures
Infection Simulation	43	Data analysis, systems thinking	Disease spread modeling, prevention impact