

RESOURCE LIBRARY
UNIT

The Truth About Germs

Empower students to make change in their communities as they explore why germs make people sick more often during the winter. Students develop their data literacy skills as they learn how microbes, germs, and our immune systems are impacted by seasonal changes. This Project-Based Learning unit culminates with students sharing what they learn through a Germology Game Show that features their own evidence-based trivia questions, answers, and explanations.

GRADES

3, 4

SUBJECTS*Biology, Health***CONTENTS**

3 Lesson plans

For the complete unit with media resources, visit:

<http://www.nationalgeographic.org/unit/truth-about-germs/>

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UNIT OVERVIEW

Students are introduced to key ideas related to germs, how they make us sick, and what we can do to keep from getting sick by exploring the driving question of why germs make people sick more often during the winter. The unit launches by analyzing a graph of seasonal illnesses and eliciting students' initial hypotheses and questions in response to the driving question.

Through hands-on activities, as well as engaging with additional data representations, texts, videos, and infographics, students will gather evidence to refine their hypotheses over time. As their final products for the unit project, students will also continually create evidence-based trivia questions, answers, and explanations to communicate what they have learned to their community through an interactive game-show-style final exhibition.

Learning experiences will enable students to understand that it is not cold weather itself that makes us sick. Instead, individual factors like decreased immune response due to lack of exercise and vitamin D, the environmental factors of colder, drier air that helps viruses thrive, and spending more time around other people indoors helps germs spread. To help educate people in their community, students can also survey family members, peers, and other community members to understand what they know and don't know about germs and why many people think we get sick more often in the winter.

The unit culminates with a Germology Game Show that consists of students' evidence-based trivia questions. The game show can take place as a community event, with family members at home, or with peers in different grade levels. The final product could also take the form of a quiz-bowl-style competition, self-quiz cards, interactive digital quiz, or explanatory video.

LESSON 1: GERM FLOW | 3 HRS 55 MINS



Students are introduced to the unit's driving question about why germs make people sick more often during the winter. They then learn about microbes that cause illnesses and use an infographic to analyze findings on how viruses thrive in cold and dry conditions. Finally, students engage in a hands-on demonstration to show how far a sneeze can carry germs and consider how different activities help or prevent germs from spreading.

LESSON 2: BODIES VERSUS GERMS | 3 HRS 45 MINS



Students consider what our bodies do to help protect us from germs and create a body map to show how the different parts of the immune system work together to fight off germs. They then consider how different activities, such as diet, exercise, sleep, and being in the sunshine, affect the immune system, and how those activities vary between summer and winter. Finally, students learn how soap and hand sanitizer work to kill germs on our hands.

LESSON 3: SHARING THE TRUTH ABOUT WINTER GERMS 1 2 HRS 40 MINS



Students finalize their hypotheses and evidence-based trivia questions, answers, and explanations about why germs make us sick more often in the winter. They then present their trivia questions to peers and external audience members through a class Germology Game Show, which is the final product for the unit.

BACKGROUND & VOCABULARY

Vocabulary

Term	Part of Speech	Definition
antibody	noun	molecule that help fight disease and infection.
bacteria	plural noun	(singular: bacterium) single-celled organisms found in every ecosystem on Earth.
environment	noun	conditions that surround and influence an organism or community.
fungi	plural noun	(singular: fungus) organisms that survive by decomposing and absorbing nutrients in organic material such as soil or dead organisms.
germ	noun	disease-producing microbe.
humidity	noun	amount of water vapor in the air.
hypothesis	noun	statement or suggestion that explains certain questions about certain facts. A hypothesis is tested to determine if it is accurate.
immune system	noun	network of chemicals and organs that protects the body from disease.

Term	Part of Speech	Definition
microbe	<i>noun</i>	tiny organism, usually a bacterium.
model	<i>noun</i>	image or impression of an object used to represent the object or system.
molecule	<i>noun</i>	smallest physical unit of a substance, consisting of two or more atoms linked together.
mucus	<i>adjective,</i> <i>noun</i>	slimy, fluid secretion of some animals.
simulation	<i>noun</i>	copy or reenactment.
soap	<i>noun</i>	substance used for washing and cleaning.
symptom	<i>noun</i>	sign or indication of something.
temperature	<i>noun</i>	degree of hotness or coldness measured by a thermometer with a numerical scale.
virus	<i>noun</i>	pathogenic agent that lives and multiplies in a living cell.

