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UNIT

Germ Problem Solvers

Students consider their feelings related to sickness, then explore illness-causing germs through readings, videos, and activities. They learn what germs are, how germs spread, and how to slow their spread. Students use engineering practices to ask questions, research problems, and brainstorm solutions. For their final product of the unit project, students design a solution that will keep people healthy.

GRADES

1, 2

SUBJECTS

Biology, Health, Engineering

CONTENTS

3 Lesson plans

For the complete unit with media resources, visit:
http://www.nationalgeographic.org/unit/germ-problem-solvers/

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UNIT OVERVIEW

This unit centers on infectious viruses and bacteria that make children sick, simply referred to as *germs* in the unit. Additionally, students learn the engineering design process to solve a problem. After starting the unit with a social-emotional connection between feelings and sickness, students explore the germs that make them sick through read-aloud texts, videos, and a hands-on lab. Students then consider how germs spread and how to slow their spread.

For a final product, students design a solution that slows the spread of germs. As they work through the engineering design process throughout the unit, students ask questions, research the problem, brainstorm solutions, and plan their solutions.

As an extension, students prototype their solutions, or even test, evaluate, improve, and redesign their prototypes, as time allows. Students could share their solutions by making posters for their school's hallways or crafting short PSAs to share during morning announcements.

LESSON 1: TINY GERMS AND BIG FEELINGS | 1 HR 15 MINS

Students share their sick-day experiences. They draw a picture of themselves when they're sick and make connections to the final product of the unit project. Students discuss a story about someone who is sick. Students share their ideas about what makes people sick. Using the See, Think, Wonder thinking routine, students make sense of images of microbes responsible for illnesses.

LESSON 2: SLOWING THE SPREAD | 2 HRS 45 MINS

Using the engineering design process, students research solutions for stopping the spread of germs, discuss barriers to these solutions, and consider how to overcome these problems. They simulate the spread of germs, model how soap kills germs, and observe high-touch areas. In groups, students pick a problem to solve, explore existing solutions, and brainstorm solutions.

LESSON 3: GERM-STOPPING SOLUTIONS | 3 HRS

Students learn the final steps of the engineering design process and reflect on an unsuccessful attempt at trying something difficult. After reviewing the final product of the unit project, checklist, and rubric, students finalize their germ-stopping solutions. For their final products, students identify their target audience, prepare outlines, and practice. Students present their designs and complete a unit reflection.

BACKGROUND & VOCABULARY

Vocabulary

Term	Part of Speech	Definition
agar	*noun*	gelatinous extract of red algae used especially for growing cultures
barrier	*noun*	obstacle or object that prevents movement.
brainstorm	*verb*	to discuss a problem and suggest solutions or ideas
context	*noun*	set of facts having to do with a specific event or situation.
disinfect	*verb*	to clean and remove harmful microorganisms.
engineering design process	*noun*	series of steps that guides engineers as they solve problems.
germ	*noun*	disease-producing microbe.
limitation	*noun*	something that limits, controls, or reduces; a restrain
model	*noun*	image or impression of an object used to represent the object or system.
petri dish	*noun*	small, shallow dish made of glass or plastic with a loose cover used for growing bacteria cultures
prediction	*noun*	forecast or projected outcome of a situation.
research	*noun*	scientific observations and investigation into a subject, usually following the scientific method: observation, hypothesis, prediction, experimentation, analysis, and conclusion.
solution	*noun*	an answer to a problem.
tally	*noun*	a recorded number of items.