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UNIT

Misunderstood Microbes

Students learn to make connections between the systems of the human body and common microbes that live in and on humans.

GRADES

5 - 9

SUBJECTS

Biology, Health

CONTENTS

3 Lesson plans

For the complete unit with media resources, visit:

<http://www.nationalgeographic.org/unit/misunderstood-microbes/>

In collaboration with



UNIT OVERVIEW

In this unit, students engage in a variety of activities to learn how the human body is organized into systems and some of the microbial organisms that live there, with an emphasis on the idea that microbes can be helpful and harmful. They then leverage their understanding to create a public service announcement (PSA) that will inform their community about the biology, risks, and possible benefits of a specific microbe. Their PSA will include an evidence-based argument regarding the value of eradicating the microbe.

Use this [unit at a glance](#) to explore a brief outline of the materials included in this resource.

Unit Driving Question: Which microbes should we protect or eradicate to keep our bodies healthy?

LESSON 1: GETTING ORGANIZED | 4 HRS



In this series of activities, students are introduced to the main types of microbes, scientific classification, how scientists organize living organisms, and the organization of the human body.

LESSON 2: MICROBES IN AND ON HUMANS | 4 HRS



Through the lens of human body system organization, students learn how microbes can be helpful or harmful to humans. In this series of activities, students engage in jigsaw reading activities and with online interactives, videos, and an infographic. They keep track of their ideas in order to reflect on their understanding over time. Students also analyze the design features of six public service announcements (PSAs) as they prepare to create their own PSA in a later lesson.

LESSON 3: INTRODUCE A MICROBE TO THE WORLD! | 5 HRS



Students collaborate to create and present their own public service announcement (PSA) that introduces a particular microbe to their community, including an evidence-based argument regarding the value of eradicating the microbe.

BACKGROUND & VOCABULARY

Vocabulary

Term	Part of Speech	Definition
algae	<i>plural noun</i>	(singular: alga) diverse group of aquatic organisms, the largest of which are seaweeds.
allergen	<i>noun</i>	substance (such as pollen) that induces a negative bodily reaction, such as sneezing, wheezing, itching, or difficulty breathing.
allergic	<i>adjective</i>	having a consistent, unusual, negative reaction to a substance.
allergy	<i>noun</i>	sensitivity to a specific substance (such as pollen) which causes a negative bodily reaction, such as sneezing, wheezing, itching or difficulty breathing.
anatomical features	<i>noun</i>	structure, form, or appearance of features relating to the body structure of organisms.
bacteria	<i>plural noun</i>	(singular: bacterium) single-celled organisms found in every ecosystem on Earth.
cell	<i>noun</i>	smallest working part of a living organism.
digestive system	<i>noun</i>	series of organs and glands responsible for the ingestion, digestion, and absorption of food. Also called the alimentary canal.
disease	<i>noun</i>	harmful condition of a body part or organ.
ecosystem	<i>noun</i>	community and interactions of living and nonliving things in an area.
electron microscope	<i>noun</i>	powerful device that uses electrons, not light, to magnify an image.
eradicate	<i>verb</i>	to destroy or remove.
eradication	<i>noun</i>	total destruction.
eukaryotic	<i>adjective</i>	relating to organisms whose cells have a nucleus.
foodborne	<i>adjective</i>	caused by food contaminated with disease-causing germs or toxic substances.
function	<i>verb</i>	to work or work correctly.
fungi	<i>plural noun</i>	(singular: fungus) organisms that survive by decomposing and absorbing nutrients in organic material such as soil or dead organisms.
genus	<i>noun</i>	taxonomic category of structurally or phylogenetically related species.
immune system	<i>noun</i>	network of chemicals and organs that protects the body from disease.
implication	<i>noun</i>	suggestion or hint.

Term	Part of Speech	Definition
infectious agent	<i>noun</i>	something (such as a bacterium or virus) that causes disease; also referred to as a pathogen.
inform	<i>verb</i>	to provide knowledge.
ingestion	<i>noun</i>	the act of eating or consuming.
integumentary system	<i>noun</i>	set of organs that form the external covering of the body and protects it from many threats such as infection (in humans, this includes skin).
interaction	<i>noun</i>	relationship between two or more forces, objects, or organisms.
Linnaean classification	<i>noun</i>	grouping based on physical and genetic characteristics following the methods of the Swedish botanist Carl Linnaeus.
magnification	<i>noun</i>	measurement of how enlarged an image is
microbe	<i>noun</i>	tiny organism, usually a bacterium.
microbiology	<i>noun</i>	study of the structure, function, and behavior of microscopic organisms.
microbiome	<i>noun</i>	microorganisms and genetic material present in or on a specific environment.
multicellular	<i>adjective</i>	composed of more than one cell.
nervous system	<i>noun</i>	cells, organs, and tissues including the brain and spine that respond to internal and external stimuli.
organ	<i>noun</i>	group of tissues that perform a specialized task.
organelle	<i>noun</i>	specialized part of a cell that performs a specific function.
organism	<i>noun</i>	living or once-living thing.
pathogen	<i>noun</i>	organism that causes a disease, such as a virus.
persuade	<i>noun</i>	to convince someone to do or believe something through reasoning or argumentation.
photosynthesis	<i>noun</i>	process by which plants turn water, sunlight, and carbon dioxide into water, oxygen, and simple sugars.
prokaryotic	<i>adjective</i>	relating to organisms whose cells have no distinct nucleus.
protozoa	<i>noun</i>	one-celled organisms in the kingdom protista, such as amoebas. (singular: protozoan)
respiratory system	<i>noun</i>	system where oxygen is taken into the body and an exchange of oxygen and carbon dioxide takes place; in humans consisting especially of the nose and lungs.
scale	<i>noun</i>	distinctive relative size, extent, or degree.
single-celled	<i>adjective</i>	having or consisting of a single cell (also referred to as unicellular).

Term	Part of Speech	Definition
species	<i>noun</i>	group of similar organisms that can reproduce with each other.
structure	<i>noun</i>	system of organization.
subsystem	<i>noun</i>	system that is part of a larger system.
symptom	<i>noun</i>	sign or indication of something.
system	<i>noun</i>	collection of items or organisms that are linked and related, functioning as a whole.
tissue	<i>noun</i>	cells that form a specific function in a living organism.
transmit	<i>verb</i>	to pass along information or communicate.
unicellular	<i>adjective</i>	having one cell.
vector	<i>noun</i>	animal that transmits a disease from one organism to another.



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