

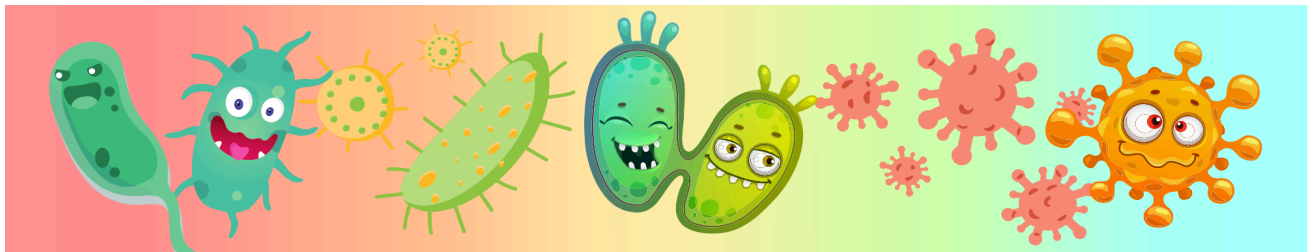
artsNOW

Integrated learning solutions

MYTHICAL MICROORGANISMS

Grade Band: 4-5

Content Focus: Theatre & Science



LEARNING DESCRIPTION

Microscopic superheroes and supervillains with strange names – sounds like science fiction, but it is the world of microorganisms. In this lesson, students will learn about types of microorganisms and their benefits and harms. They will then apply that understanding to create and act out an original microorganism and the host that it hurts or helps.

LEARNING TARGETS

| Essential Questions | “I Can” Statements |
|---|--|
| What are microorganisms and how do they benefit or harm humans? | I can work with a partner to create an original microorganism. |
| How can we use drama and imagination to explore microorganisms? | I can use my voice and body to portray a character. |
| How does a microorganism impact a host? | I can explain the relationship between a microorganism and its host. |



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GEORGIA STANDARDS

| Curriculum Standards | Arts Standards |
|--|---|
| Grade 5 S5L4. Obtain, evaluate, and communicate information about how microorganisms benefit or harm larger organisms. | Grade 5 TA5.CR.1 Organize, design, and refine theatrical work. TA5.PR.1 Act by communicating and sustaining roles in formal and informal environments. |

SOUTH CAROLINA STANDARDS

| Curriculum Standards | Arts Standards |
|---|---|
| Grade 5 5.L.4B.3 Construct explanations for how organisms interact with each other in an ecosystem (including predators and prey, and parasites and hosts). | Anchor Standard 1: I can create scenes and write scripts using story elements and structure. Anchor Standard 3: I can act in improvised scenes and written scripts. Anchor Standard 8: I can relate theatre to other content areas, arts disciplines, and careers. |

KEY VOCABULARY

| Content Vocabulary | Arts Vocabulary |
|--|---|
| <ul style="list-style-type: none"> ● <u>Organism</u> – A living being; any living thing that has an organized structure, can react to stimuli, reproduce, grow, adapt, and maintain homeostasis (physical stability) ● <u>Microorganism</u> – An organism that is invisible to the human eye, and can only be seen through a microscope; typically consisting of a single cell ● <u>Benefit</u> - An advantage or profit gained from something; a positive effect ● <u>Harm/harmful effect</u> – A disadvantage or loss suffered because of something; a negative effect ● <u>Virus</u> - An infectious microorganism that typically consists of a nucleic acid molecule in a protein coat, and is able | <ul style="list-style-type: none"> ● <u>Character</u> - A person, an animal or other figure assuming human qualities, in a story ● <u>Voice</u> – An actor’s tool, which we shape and change to portray the way a character speaks or sounds ● <u>Body</u> – An actor’s tool, which we shape and change to portray the way a character looks, walks, or moves ● <u>Dialogue</u> – Conversation between characters ● <u>Scene</u> – The dialogue and action between characters in one place for one continuous period of time ● <u>Relationship</u> – The connection between two characters, and the ways in which |



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| | |
|--|--|
| <p>to multiply only within the living cells of a host</p> <ul style="list-style-type: none"> ● <u>Bacteria</u> - Unicellular microorganisms which have cell walls but lack organelles and an organized nucleus, including some that can cause disease ● <u>Protozoa</u> - Single-celled microscopic animals ● <u>Fungi</u> – Spore-producing organisms that feed on organic matter; including molds, yeast, mushrooms, and toadstools ● <u>Algae</u> - Simple, nonflowering, and typically aquatic plants that include seaweeds and many single-celled forms | <p>they regard and behave toward one another</p> |
|--|--|

MATERIALS

| |
|--|
| <ul style="list-style-type: none"> ● Pencils ● Paper |
|--|

INSTRUCTIONAL DESIGN

| Opening/Activating Strategy |
|--|
| <ul style="list-style-type: none"> ● Begin with a “Character Walk”. <ul style="list-style-type: none"> ○ Have students walk around the classroom randomly. Establish a verbal or other cue (clap, drumbeat) for stopping. ○ Direct students to stop, then have them lead with a certain part of the body (e.g., chin, left knee, chest, big toe, forehead, right shoulder, finger tips, etc.). ○ Continue stopping the movement, providing another cue, and then starting again. Possibly add in organs and other internal parts (e.g., heart, brain, spine, biceps, lungs, etc.). ○ Use observational language to comment on interesting and effective individual choices (e.g., “I see when Marissa leads with her left knee, it makes her right arm swing out to the side,” or “Leading with his heart, Khalil has a very caring look on his face.”) ● Have students return to their seats. <ul style="list-style-type: none"> ○ Discuss how bodies have many different parts that work together in different ways. ○ Ask students how bodies are really like ecosystems. ○ Tell students that bodies have multitudes of tiny organisms known as microorganisms. |



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Work Session

- Introduce/review information on microorganisms.
 - Include types of microorganisms (as aligned with specific curriculum and standards): algae, bacteria, fungi, protozoa, viruses.
 - Include specific subcategories and specific microbes as relates to curriculum and standards, e.g., tardigrades, rotifers, probiotics, salmonella, e-coli, etc.
- Explain that students will work in pairs to apply knowledge about real microorganisms to create their own original microorganisms.
 - Have students find a partner. Students will determine which partner will be the microorganism and which partner will be the host.
 - Have partners determine the physical attributes of the microorganism: Size (in millimeters), shape, color, etc.
 - Have partners determine the effects that the microorganism has on its host, specifically articulating if the effects are beneficial or harmful (remind students that a microorganism can have multiple effects).
 - Have partners create an original name for their microorganism (remind students that most microorganism names come from Latin and sound scientific, but might be variations on known words or names).
- Tell students that they will be writing a scene between the microorganism and the host.
 - The scene should have dialogue between the two characters.
 - Tell students that they will use their voice and bodies to become the two characters in their script.
 - Explain to students that actors use their voices as a tool to portray the way a character speaks or sounds. Actors use their bodies as a tool to portray the way a character looks and moves.
 - Allow time for students to write and rehearse.
- Have students partner with another pair. They will perform their scenes for each other.
 - Discuss audience etiquette with students prior to performances.
- Ask for pairs to volunteer to share their scenes with the entire class.
 - Facilitate a discussion around how each partner embodied the host and the microorganism. Reflect on the effect that the microorganism had on the host.

Closing/Reflection

- Facilitate a class discussion using the following questions as a guide:
 - How did you incorporate understanding of real microorganisms into your creation of an imaginary microorganism?
 - To what extent do you think the microorganism you created could be possible? Why?

ASSESSMENTS

Formative

Teachers will assess students' understanding throughout the lesson by observing student engagement with the microorganisms content and how pairs collaborate to create their microorganisms and the host relationships.

Summative



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CHECKLIST

- Students can work with a partner to create an original microorganism.
- Students can use their voice and body to portray a harmful or beneficial relationship between a microorganism and host.
- Students can explain the relationship between a microorganism and its host.

DIFFERENTIATION

Acceleration:

- Have students determine both benefits and harms for their microorganism, and have them enact the effects in several stages from mild to intense.
- Have students draw illustrations of their organism and its host under its effects.

Remediation:

- After initial modeling, brainstorm with the entire class and have pairs enact the same set of organisms and effects.
- Provide a template for students to write a script.
- Have banks of ideas visibly available for microorganisms names, benefits, and harmful effects. These can be prepared ahead of time, or brainstormed with the entire class prior to partner work.

ADDITIONAL RESOURCES

Links to possible sources for graphics and videos to use for this lesson:

- <https://www.flickr.com/photos/121935927@N06/13537347284>
- <https://www.youtube.com/watch?v=4XPQbipFR6M>
- <https://www.toppr.com/guides/biology/microorganisms/microorganisms-and-its-uses/>
- <https://www.toppr.com/ask/content/concept/harmful-microorganisms-219859/>
- <http://www.microbiologynutsandbolts.co.uk/the-bug-blog/colonisation-vs-infection>
- <https://www.nextgurukul.in/wiki/concept/cbse/class-8/science/microorganisms-friend-and-foe/world-of-microorganisms/3957829>

**This integrated lesson provides differentiated ideas and activities for educators that are aligned to a sampling of standards. Standards referenced at the time of publishing may differ based on each state's adoption of new standards.*

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MICROORGANISMS CHART

| Microorganism | Type | Effects on humans |
|-------------------------------|----------|---|
| Tardigrades | protozoa | can help human DNA withstand radiation, genes could help preserve food |
| Lactobacillus | bacteria | helps break down food, absorb nutrients, resist infection, treat skin problems, some harmful side effects |
| Probiotics | bacteria | fight illness and infection, treating allergies and asthma, but can trigger allergies |
| Rotifers | protozoa | can help heal coral reefs, a food source for many animals, can help fight parasitic disease |
| Salmonella | bacteria | can make people and animals sick, can lead to arthritis and digestive problems |
| Rabies | virus | can damage the brain and nerves, and without treatment leads to death |
| Clostridium botulinum (Botox) | bacteria | can cause paralysis or nausea, blurred vision, drooping eyelids, breathing trouble |
| E-coli | bacteria | can cause cramps and diarrhea, fever and nausea |
| Algae | algae | bottom of ocean food chain, blooms can kill fish and damage the environment |
| Coronavirus | virus | can cause multiple symptoms, including difficulty with breathing, body pain, and fatigue, and can lead to death |



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Microorganisms Partners Script

Host: I'm a ----- (name), a ---- (number) foot tall -----
(mammal, reptile, bird, amphibian, fish).

Microorganism: I'm a ----- (made-up name), a ---- (number or
fraction) millimeter ----- (algae, bacteria, fungi, protozoa,
virus). Here's what I do

Host: Oh no! Leave me alone! Don't -----
(restatement of harmful effects)

(or)

Oh yes! Thank you very much for -----
(restatement of benefits)



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