artsNOW
Integrated learning solutions

ECOSYSTEMS IN ACTION
Grade Band: 4-5
Content Focus: Theatre & Science

LEARNING DESCRIPTION

In this lesson, students will explore animals and plants that inhabit ecosystems by using movement to deepen the retention of vocabulary. After reviewing the ecosystem players, students will play a call and response game by responding with their bodies, sound and movement to become the elements. This will be taken a step deeper when students bring their visuals to life and explain which role they play in the flow of energy of an ecosystem. The lesson culminates with Food Chain/Web Action where groups of students bring their own food chain/web to life for their classmates.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can theatre techniques help us gain a deeper understanding of ecosystems? How does interdependence play a role in an ecosystem?	I can accurately identify producers, consumers, and decomposers. I can properly order producers, consumers, and decomposers in the food chain/web.

	I can use my voice and body to enact a producer, consumer, or decomposer when performing.

GEORGIA STANDARDS

Curriculum Standards	Arts Standards
Grade 4: S4L1. Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem.	**Grade 4:** TA4.CR.1 Organize, design, and refine theatrical work. TA4.CR.2 Develop scripts through theatrical techniques. TA4.PR.1 Act by communicating and sustaining roles in formal and informal environments. **Grade 5** TA5.CR.1 Organize, design, and refine theatrical work. TA5.CR.2 Develop scripts through theatrical techniques. TA5.PR.1 Act by communicating and sustaining roles in formal and informal environments.

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
Grade 5: 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	**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
• Bacteria - Microorganisms that can make you sick, but also can help you digest food; this is found everywhere in nature.	• Theater - Dramatic literature or its performance; drama • Character - A person, an animal or other figure assuming human qualities, in a story

- Carnivore - An animal that eats only other animals
- Community - All the organisms is an ecosystem
- Consumer - An animal that gets its energy by eating plants or other animals
- Decay - To break down into simpler materials
- Decomposers - A living thing that breaks down the remains of dead organisms
- Ecology - The study of how living and nonliving factors interact
- Food chain/web - The path of energy in an ecosystem from plants to animals (from producers to consumers)
- Habitat - The place where an animal or plant lives
- Herbivore - An animal that eats on plants
- Interdependence - Living things in an ecosystem need each other to meet their needs
- Microorganisms - Very small living things
- Niche - The role of an organism in an environment
- Omnivore - An animal that eats both plants and animals
- Organism - A living thing
- Photosynthesis - Process through which plants make food

- Voice – An actor's tool, which we shape and change to portray the way a character speaks or sounds
- Body – An actor's tool, which we shape and change to portray the way a character looks, walks, or moves
- Ensemble - All the parts of a thing taken together, so that each part is considered

• Plankton - Small organisms in water that are producers and give off oxygen	

MATERIALS

- Handout words: (one word per page) bear, mushroom, cactus, wolf, sea turtle, shark, plankton, bacteria, fish, fungi, giraffe, tree, bush, worm, grasshopper, caterpillar, mouse, crow, panther, snake, pigeon, dog, squirrel, cat, rose bush, grass
- Visuals – GROUP #1 (one image per page) sun, plant, grasshopper, lizard, eagle, mushroom
- Visuals – GROUP #2 (one image per page) sun, plankton, fish, jellyfish, sea turtle, shark, bacteria

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

Classroom set-up will be key for this lesson! Set up chairs and tables in a circular format, to maximize students' engagement and ability to see their peers during the activity and performance.

- Start with a general physical warm-up to get the students' bodies ready. Use exercises such as:
  - **Stretching:** Stretch all major muscle groups.
  - **Shaking Out Limbs:** Shake out arms, legs, and the whole body to release tension.
  - **Energy Passes:** Stand in a circle and pass a clap or a simple motion around to build group focus and energy.
- Explain that students will explore different characters by changing their walk and physicality. Encourage them to think about how their character's age, status, mood, and personality influence their movement.
  - Begin with simple prompts to get students thinking about different ways to walk. Call out various types of characters and ask students to walk around the space embodying those characters. Examples include:
    - An elderly person with a cane
    - A proud soldier
    - A sneaky thief
    - A graceful dancer
- Have students return to their seats.

Work Session

ORGANISMS/ECOLOGY/ECOSYSTEMS INTRODUCTION

- Ask students, "When I say the word 'organism' what comes to your mind?".
  - Tell students that an organism is a living thing.
  - Ask students for examples of organisms.
  - Tell students that all organisms need energy and matter to live and grow.
  - Ecology is the study of how living and nonliving factors interact. Ecologists study these factors by investigating ecosystems.

- Ask students,"When I say the word 'Ecosystem' what comes to your mind?"
    - Tell students that an ecosystem is made up of living and nonliving things in the environment (animals, plants, soil and water).
    - Things living in an ecosystem depend on one another for basic needs such as food, shelter and protection.
- **INTERDEPENDENCE:** The living things found in an ecosystem are interdependent because living things depend on each other to meet their needs.
    - Many animals depend on plants for food, but organisms also depend on each other for other things, too. For example, plants can be a source of shelter for animals. In turn, animals can provide protection for plants.
- **NICHE - RELATIONSHIPS IN AN ECOSYSTEM:** Ask students, "Does everyone at your school do the same thing? Do they have the same duties or jobs? What do the students do? What does the principal do? What do the cafeteria staff, custodians, teachers, etc. do?"
    - Tell students that just like in a school or office or community, an ecosystem is filled with things that each have specific jobs to do.
    - All of the organisms within an ecosystem have different roles. These roles are called niches.
    - Organisms can have more than one niche and knowing the niches of an organism can help to explain why they act and interact the way they do.
    - To determine an organism's niche, you need to identify: What it eats, where it lives, and how it interacts with the other organisms in the same ecosystem.
    - Niches include:
        - Producers produce food energy for themselves and others. They get energy from the sun and make food through photosynthesis. Most producers are plants (trees, grasses, shrubs). Some producers are non-plants (algae, some bacteria).
        - Consumers consume the food made by the producers. They get energy from eating other organisms. Some examples include insects, birds, mammals, reptiles and amphibians.
        - Herbivores eat producers (plant eating niche).
            - Forest – deer, rabbits
            - Savannah – zebras, elephants
        - Carnivores eat other consumers (meat eating niche).
            - Marine – sharks, walruses
        - Omnivores eat both producers and consumers.
            - Forest – bear, raccoon
        - Decomposers are living things that break down the remains of dead organisms. They eat dead things and turn them back into dirt or soil. Decomposers turn dead material into good fertilized soil.
            - Examples: Mushrooms, bugs, worms

USING MOVEMENT IN VOCABULARY

- Give each term a movement when you say the word while you review details about each.
- Vocabulary Movements:
    - Producers:
        - "Pro" – hands cupped together/left over right
        - "du" - hands cupped together/right over left
        - "cers" – twirls fists in front of body and then point fingers away from body

- Consumers:
  - “Con” – right hand – thumb and fingers like eating food to mouth
  - “sum” – left hand – thumb and fingers like eating food to mouth
  - “ers” – point both thumbs to chest
- Herbivores:
  - “Herb” – right hand pull “leaf off of a tree”
  - “i” – left hand pull “leaf off a tree”
  - “vores” – bring hands to mouth to “eat”
- Carnivores:
  - “Carn” – right hand claw towards air
  - “i” – left hand grab right wrist
  - “vores” – right hand comes to mouth like eating a big turkey wing
- Omnivores:
  - “Om” – right hand pull “leaf off of a tree”
  - “ni” - left hand claws out
  - “vores” – left and right hand–thumb and fingers like eating food to mouth
- Decomposers:
  - “De”-- right fist hits top of left fist
  - “com” – left first hits top of right fist
  - “posers” – fingers wiggle like an insect

ECOSYSTEM CALL & RESPONSE

- Call out the name of an animal or plant and ask the students to respond with the name and movement that applies to it (i.e., producer, consumer or decomposer).
- If it’s a consumer then take the answer a step further and ask them to respond with the name and movement that applies to their type (herbivore, carnivore, predator, omnivore).
  - Cherry tree (producer)
  - Mushroom (decomposer)
  - Bear (consumer/omnivore)
  - Shark (consumer/carnivore)
  - Bush/shrub (producer)
  - Rabbit (consumer/herbivore)
  - Human (consumer/omnivore)
  - Tulip (producer)
  - Panther (consumer/carnivore)
  - Giraffe (consumer/herbivore)
  - Worm (decomposer)
  - Mushroom (decomposer)

WHAT’S THE ROLE?

- Hand each student a visual that lists a name of a producer, consumer or decomposer on it.
  - Ask them to sit like their visual and make a sound that it would make (imagine what that sound would be if it doesn’t actually make a sound–such as a plant).
  - Have students act out their visuals and ask the others to guess if it’s a consumer, producer or decomposer.
  - Handout words: bear, mushroom, cactus, wolf, sea turtle, shark, plankton, bacteria, fish, fungi, giraffe, tree, bush, worm, grasshopper, caterpillar, mouse, crow, panther, snake, pigeon, dog, squirrel, cat, rose bush, grass.

FOOD CHAIN/WEB REVIEW

- Ask students to think about all the things their bodies do every day—read, think, and talk. Your heart beats inside you. You play with your friends.
- Tell students that it takes energy to make these things happen. Energy powers everything that living things do. Every living thing needs energy in order to live.
- Every time animals do something (run, jump) they use energy to do so. Animals get energy from the food they eat, and all living things get energy from food. Plants use sunlight, water and nutrients to get energy (in a process called photosynthesis).
- Energy is necessary for living beings to grow. A food chain/web shows how each living thing gets food, and how nutrients and energy are passed from creature to creature.
    - Food chains/webs begin with plant-life and end with animal-life.
    - Some animals eat plants, some animals eat other animals. Energy is passed from one organism to another when organisms eat plants or other living things. We call this flow of energy a food chain/web.
    - A food chain/web is a way of organizing living things by what they eat.
    - Show students a food chain/web example – grass/grasshopper/mouse/snake.
        - The grass is at the bottom of the food chain because it is the producer.
        - The grasshopper is the first-level consumer because it eats the grass.
        - The mouse is the second-level consumer because it eats the grasshopper.
        - Finally, the snake is the top-level consumer, because it is at the top of the food chain.
    - The food chain/web shows who's eating whom. The arrows in a food chain/web show the flow of energy. The arrows are drawn from the food source to the consumer. Arrows can be always replaced with the words, “is eaten by”. For example, in our food chain/web example, you could say, “The grass is eaten by the grasshopper.”

BIGGER FOOD CHAINS

- Here's another food chain, with a few more animals.
    - It starts with acorns, which are eaten by mice. The mice are eaten by snakes, and then finally the snakes are eaten by hawks.
    - At each link in the chain, energy is being transferred from one animal to another. There can be even more links to any food chain.
        - If you add another animal, it may go: Grass to grasshopper to mouse to snake to hawk.
        - There is actually even more to this chain. After a hawk dies, fungi (like mushrooms) and other decomposers break down the dead hawk, and turn the remains of the hawk into nutrients, which are released into the soil.
        - The nutrients (plus sun and water) then cause the grass to grow. It's a full circle of life and energy!

FULL CIRCLE OF LIFE AND ENERGY

- Food chains/webs make a full circle, and energy is passed from plant to animal to animal to decomposer and back to plant!
- There can be many links in food chains but not TOO many.
    - If there are too many links, then the animal at the end would not get enough energy.

FOOD CHAINS IN ACTION

- Group students and hand out visuals (ideally–group #1 – 6 students, group #2 – 7 students).
- Give each group their visuals. Each student should have one visual.
    - Ask students to look at their picture and use their bodies to become what is represented in their visual. Ask them to add a sound.
    - Ask students: “Using a voice different from your own, tell me what you are in your food chain (producer, consumer or decomposer)”.
    - Then have them show their pictures to the others in their group.
    - Ask them to write down the following on their visuals or on a scratch paper: What is your ecosystem? (ocean, forest, etc.). What sounds do you hear in your ecosystem? What things do you see in your ecosystem?
        - What other animals?
        - What other plants?
    - Students should share their responses with their group mates.
    - Next, ask students to put themselves in the proper order of their food chain/web.
    - Students should use their bodies and voices to portray their plant/animal and introduce themselves in the order of the food chain/web.
    - Allow time for students to practice before presenting to the class.

Closing/Reflection

- Students will present their living food chain/web for the class. Discuss appropriate audience participation and etiquette prior to performances.
- Debrief after each group to determine whether the group arranged themselves correctly.

ASSESSMENTS

Formative

Teachers will assess students’ understanding of the content throughout the lesson by observing students’ participation in the activator, discussion of ecosystems and food chains/webs, participation in using movement to demonstrate the parts of a food chain/web, and collaboration with their groups to show food chains/webs in action.

Summative

CHECKLIST

- Students can accurately identify producers, consumers, and decomposers.
- Students can properly order producers, consumers, and decomposers in the food chain/web.
- Students can use their voices and bodies to enact a producer, consumer, or decomposer when performing.

DIFFERENTIATION

Acceleration: Have students write a script that uses dialogue between their animal/plant in the ecosystem and another one in the same ecosystem.

Remediation:

- Provide a food chain/web template for students to complete for their ecosystem prior to organizing themselves in the correct order for their performances.
- Scaffold the lesson by modeling with students how to complete the Food Chain in Action activity with an example ecosystem.

ADDITIONAL RESOURCES

NA

**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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SYNCHRONICITY THEATRE SMART. GUTSY. BOLD.