

Wartburg College Lesson Plan Outline

Candidate:	Emily Cook	Date:	08/01/19	Subject(s):	Science, Ecosystem, movement of matter, Aquarium/Fish, Writing/speaking
School:		Grade Level:	5	Student #:	
Cooperating Teacher:					
Lesson Title:	Let's Create an Ecosystem: Exploring the Movement of Matter (1 week)				
NGSS:	5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.				
Common Core Standards:	<p>CCSS.ELA-LITERACY.RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.</p> <p>CCSS.ELA-LITERACY.SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.</p> <p>CCSS.ELA-LITERACY.SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.</p>				
Objective (cognitive):	<ul style="list-style-type: none"> • Students will be able to describe the movement of matter among plants, animals, and decomposers including: The relationships in the system between organisms that consume other organisms. The relationship between organisms and the exchange of matter from and back into the environment (e.g., organisms obtain matter from their environments for life processes and release waste back into the environment, decomposers break down plant and animal remains to recycle some materials back into the soil). 				

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	<ul style="list-style-type: none"> • Students will be able to identify within the ecosystem model (aquarium) relevant components, including matter, plants, animals, decomposers, and the environment. • Students will be able to use the aquarium ecosystem to describe: <ul style="list-style-type: none"> The cycling of matter in the system between plants, animals, decomposers, and the environment. How interactions in the system of plants, animals, decomposers, and the environment allow multiple species to meet their needs. That newly introduced species can affect the balance of interactions in a system (e.g., a new animal that has no predators consumes much of another organism’s food within the ecosystem). That changing an aspect (e.g., organisms or environment) of the ecosystem will affect other aspects of the ecosystem.
<p>(affective):</p>	<ul style="list-style-type: none"> • Students will be able to cooperate in a meaningful class discussion by contributing to the conversation at least one time. • Students will be able to work respectfully in small groups and individually to work on various activities given by the teacher.
<p>(psychomotor):</p>	<ul style="list-style-type: none"> • Students will create an aquarium ecosystem to describe a phenomenon that includes the movement of matter within an ecosystem. • Students will work in small groups to develop a research project on an ecosystem of their choosing and present to the class comparing and contrasting their ecosystem to the class’ aquarium. They will present their research project using a PowerPoint.

Materials & Supplies LISTED:

Aquarium kit (20 gallon tank, rocks, water chemicals, plants, water filter, decorations)

Fish (2 Goldfish, Amano shrimp)

Science journals (1 per student)

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Pencils (1 per student)

Food Chain Vocabulary poster (1 for teacher)

The Food Chain video

Computer, screen, and projector (1 of each for teacher)

Laptops (1 per student)

Whiteboard (1 for teacher)

Dry erase markers (1 for teacher)

Ecosystem research project rubric (1 for teacher and each student)

Anticipatory Set (Pre-reading & Prerequisite Skills):

- Lead a class discussion reviewing with students what decomposers, producers, and consumers are.
- Ask students to discuss with a partner this leading question: Do you think the sun's energy is the only thing that moves between organisms... or do you think something else also flows through the food chain?
- Students will record their ideas on sticky notes and post them on the whiteboard.
- Play the Food Chain video for students.

Modeling/ Explanation (I can):

- Write down the main ideas of Food Chain video.
 - Have students copy down the notes in their science journals
- Pull out the Food Chain Vocabulary poster and go through it.
- Talk about the different types of matter in an ecosystem that move between the organisms in the food chain and their relationship with one another.
 - Discuss: Matter, Non-Recyclable Energy vs. Recyclable Matter, Types of Nutrients, and Chemical Containments
- Tell students that together as a class they will be developing a model to describe the movement of matter among plants, animals, decomposers, and the environment in the form of an aquarium.

Check for Understanding: Ask the students what questions they have about the food chain.

Reteach If Needed: Remind students that a food chain is a single pathway and by which energy and matter flow through an ecosystem. Use the food chain vocabulary poster and video to answer questions the students may have.

Guided Practice/ Engagement & Exploration (We can):

- Choose the best spot in the classroom to place the aquarium tank.
- Put together all of the components in the fish tank.

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- Add the fish and shrimp last.
- Ask students to identify matter, plants, animals, decomposers, and the environment.
- Students will write and/or draw notes about the aquarium's ecosystem in their science journals.

Check Understanding: Ask student to explain how they think matter will move within the aquarium and what factors may cause a problem within the ecosystem.

Independent Practice (You can):

- Students will use their science journals to write at least one page about the movement of matter the cycling of matter in the system between plants, animals, decomposers, and the environment. They will include the relationships in the system between organisms that consume other organisms and the relationship between organisms and the exchange of matter from and back into the environment.
- To conclude their summary, they will write at least 3 questions they still have about ecosystems and the movement of matter.

Closure:

- Introduce to students the ecosystem research project.
 - Hand out the rubric to each student.
 - Have students quietly move around the room to find a group of 4.
 - Give students 10 minutes to discuss what ecosystem they are going to do their project on.
- Exit ticket 1: Students will turn in their science journals.
- Exit ticket 2: Students will report to the teacher the topic of their research project.

Assessment:

- Students will be graded on completion of writing notes during the video and class discussion including all the key ideas.
- Students will be graded on participation points in class discussions and activities.
- Students will be graded on completion of their one-page summary in their science journals including at least 3 questions they still have.

Enrichment/Extension:

- To further expand students' understanding and knowledge of the movement of matter, students can work in pairs or small groups to create a poster displaying the roles in ecosystems. They may have to use their laptops to do further research on the topic.

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- The teacher will assign students to different responsibilities in caring for their new class pets.

Modification/ Differentiation:

RTI: Students with learning disabilities can have a modified version of the research project using whatever visuals they need to present their project with a partner of their choosing or by themselves.

TAG: Students will be asked to work together to research the nitrogen cycle and create a poster as well as making labels to put on the fish tank to describe how the nitrogen cycle works within the aquarium. They will then research how best to keep the nitrogen cycle as well functioning as possible in the aquarium (e.g. Using real plants instead of fake plants is more beneficial for the water's ammonia levels).

Differing abilities: Students with writing disabilities can orally explain to the teacher the movement of matter among plants, animals, decomposers, and the environment and their relationship to one another.

Sources:

The Food Chain video: <https://youtu.be/0ZOvqYypOuo>