

Matter and Energy in Ecosystems

Content Area: **Science**
Course(s): **Science 6**
Time Period: **March**
Length: **5 weeks**
Status: **Published**

Matter and Energy in Ecosystems Overview

Over a 5 week period, students will study patterns of interactions among organisms within an ecosystem. They will consider biotic and abiotic factors in an ecosystem and the effects these factors have on populations. They will also be able to understand that the limits of resources influence the growth of organisms and populations, which may result in competition for those limited resources.

Matter and Energy in Ecosystems Priority Standards

SCI.MS-LS2-1	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
SCI.MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
SCI.MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

Matter and Energy in Ecosystems Learning Goals

- Students will be able to model the cycling of matter among living and nonliving parts of an ecosystem.
- Students will be able to model the flow of energy among living and nonliving parts of an ecosystem.
- Students will be able to provide evidence, through analysis and interpretation, on the effects resource availability has on organisms in an ecosystem.
- Students will be able to provide evidence, through analysis and interpretation, on the effects resource availability has on populations of organisms in an ecosystem.
- Students will be able to use patterns of interactions between organisms to predict how the interactions will affect multiple ecosystems.

Matter and Energy in Ecosystems Learning Targets

- Students will be able to develop a model describing the conservation of matter into and out of various ecosystems.
- Students will be able to develop a model describing the flow of energy into and out of various ecosystems.
- Students will be able to make predictions about the impact within and across ecosystems of competitive, predatory, or mutually beneficial relationships as abiotic or biotic.
- Students will be able to recognize and describe the roles of producers, consumers, and decomposers.
- Students will be able to summarize how energy or matter flows through food webs.

- Students will be able to use cause and effect relationships between resources and organisms to provide evidence on the growth of organisms during periods of abundant and scarce resources.
- Students will be able to use cause and effect relationships between resources and populations of organisms to provide evidence on the growth of populations during periods of abundant and scarce resources.
- Students will recognize or recall specific vocabulary, including: food web, producer, consumer, decomposer, matter, energy.

Matter and Energy in Ecosystems Essential Questions

- How do available resources affect populations of organisms?
- How do living and nonliving parts of an ecosystem affect the cycling of matter and flow of energy?
- How do the interactions of different organisms affect multiple ecosystems?

21st Century Themes

CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters [®] and determine attributes of career success.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.

Marzano Elements

- DQ 1-1 Providing Clear Learning Goals and Scales
- DQ 2-6 Identifying Critical Information
- DQ 3-14 Reviewing Content
- DQ 3-16 Using Homework
- DQ 3-19 Practicing Skills, Strategies, and Processes
- DQ 4-21 Organize Students for Cognitively Complex Tasks
- DQ 4-23 Providing Resources and Guidance

Differentiated Instruction

- Have individual students explain content understanding in their own words
- Use a variety of visual aids to help student understanding
- Use different teaching styles to introduce, explain, and reinforce content understanding
- Use small groups to check for understanding.

Assessments

- Do Now Activities

- MS-LS2-1 Learning Scale
- MS-LS2-2 Learning Scale
- MS-LS2-3 Learning Scale
- Teacher-created quizzes
- Teacher-created worksheets
- Unit Benchmark Assessment

Learning Plan

Week	Topic	Lesson Activities	Standard/Learning Goal/Target	Materials
Wk 1	Matter and Energy in Ecosystems	Do Now Activities (Warm up)	Standard: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	Power Point slides
		Review Power Point slides from online information together.	Learning Goals:	
		Show videos from You Tube on ecosystem balance https://www.youtube.com/watch?v=S0OtFAt2Iss	Students will be able to provide evidence, through analysis and interpretation, on the effects resource availability has on organisms in an ecosystem.	Chrome book
		Students will do a hands-on simulation on ecosystem balance to understand the cause-effect relationship which can affect ecosystems.	Students will be able to provide evidence, through analysis and interpretation, on the effects resource availability has on populations of organisms in an ecosystem	Videos
		Assign <i>Readworks</i> packet: http://www.readworks.org/passages/all-pieces-matter	Learning Targets:	Simulation materials
		Assign student worksheets.	Students will be able to use cause and effect relationships between resources and organisms to provide evidence on the growth of organisms during periods of	Worksheets

abundant and scarce resources.

Students will be able to use cause and effect relationships between resources and populations of organisms to provide evidence on the growth of populations during periods of abundant and scarce resources

Do Now Activities (Warm up)

Review Power Point slides from online information together.

Standard:

Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Power
Point
slides

Show video from You Tube on matter and energy in ecosystems:

Learning Goals:

Chrome
book

Wk
2

Matter
and
Energy in
Ecosyste
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<https://www.youtube.com/watch?v=7Wfs2L5IydY>

Students will be able to use patterns of interactions between organisms to predict how the interactions will affect multiple ecosystems.

Videos

Wk
3

https://www.youtube.com/watch?v=Elpp_7-yTN4

Assign *Readworks* packet:

Learning Target:

Readworks
packet

<http://www.readworks.org/passages/zebra-mussels-and-hudson-river>

Students will be able to make predictions about the impact within and across ecosystems of competitive, predatory, or mutually beneficial relationships as abiotic or biotic.

Worksheet
s

Assign student worksheets.

Do Now Activities (Warm up)

Standard:

Power
Point
slides

Wk
3

Matter
and
Energy in
Ecosyste
ms

Review Power Point slides from online information together.

Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

Chrome
book

Wk
4

Show video from You Tube on matter and energy in ecosystems:

Learning Goal:

Wk 5	Matter and Energy in Ecosystems	https://www.youtube.com/watch?v=SWvtRf4TAO4	Students will be able to model the cycling of matter among living and nonliving parts of an ecosystem.	Youtube Video
		https://www.youtube.com/watch?v=-oVavgmveyY		Readworks packet
		Assign <i>Readworks</i> packet:	Students will be able to model the flow of energy among living and nonliving parts of an ecosystem.	Worksheets
		http://www.readworks.org/passages/ecopyramid		
		Students-created food chains and food webs	Learning Target: Students will be able to develop a model describing the conservation of matter into and out of various ecosystems.	
		Assign student worksheets.		
			Students will be able to develop a model describing the flow of energy into and out of various ecosystems.	
		Do Now Activities (Warm up)	Standards: All unit standards listed above in weeks 1-4.	Power Point slides
		Complete a list of review topics in preparation for unit assessment.		Chrome book
		Complete an open-note quiz.	Learning Goals: Students will review and complete multiple assignments in order to be able to pass a standards-based assessment.	Open-note quiz
		Complete a standards review worksheet.		
		Complete a Unit learning scale on.	Learning Target: Students will complete all assignments during the review period and work collaboratively with the teacher to prepare themselves to pass a standards-	Standards-based assessment
		Complete a standards-based assessment.		List of Review

based assessment.

Topics

Learning
Scales:

MS-LS2-1

MS-LS2-2

MS-LS2-3

Materials & Resources

- Scientific hands-on materials
- Teacher choice of You Tube videos on the content
- Teacher-created Google Document
- Teacher-created Google Slide