1B: Relationships among organisms _Oct

Content Area: **Science**
Course(s):
Time Period: **October**
Length: **2 Weeks**
Status: **Published**

Unit Overview

Most organisms compete to survive, so over time they have evolved complex relationships. In this concept, you will learn how diverse organisms interact in an ecosystem.

Enduring Understandings

Lesson Objectives

By the end of the lesson, students should be able to:

- 1. Demonstrate what causes predator and prey populations to fluctuate as they interact.
  2. Make general predictions about the patterns of interactions between living things across all ecosystems.

Essential Questions

- **Overarching Question**
  - How do organisms interact in ecosystems?
- **Focus Question**
  - How do organisms interact with the living and nonliving environments to obtain matter and energy?
- **Lesson Questions**
  - How do different organisms in a community obtain energy from their environment?
  - Why are relationships between organisms in a community important?
  - How does energy move through an ecosystem?

- **Can You Explain?**
    - How do relationships among organisms help energy and matter flow through an ecosystem?

Instructional Strategies & Learning Activities

- **Observing Phenomena** [10 min]**:** Students observe the close relationship between ants and acacia trees.

Suggested Reading: Introduction

- **Investigation 1** [90 min]**:** Finding Patterns in Predation

Students act out the predator-prey relationship to determine why these populations cycle over time.

Suggested Reading: Sections 1-3

Suggested Reading: Sections 4-6

- **Making Sense of Phenomena** [10 min]**:** Students use the knowledge they gain in the lesson to explain the close relationship between ants and acacia trees.

Suggested Reading: Lesson Summary

Integration of Career Exploration, Life Literacies and Key Skills

Students learn about what wildlife biologists do in their careers.

	Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.
	An individual's strengths, lifestyle goals, choices, and interests affect employment and income.
9.4.8.CI.1	Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
	Multiple solutions often exist to solve a problem.
	Increases in the quantity of information available through electronic means have heightened the need to check sources for possible distortion, exaggeration, or misrepresentation.
9.4.8.IML.1	Critically curate multiple resources to assess the credibility of sources when searching for

	information.
	Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.
9.4.8.IML.3	Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4	Ask insightful questions to organize different types of data and create meaningful visualizations.
9.4.8.IML.5	Analyze and interpret local or public data sets to summarize and effectively communicate the data.
9.4.8.IML.7	Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose (e.g., 1.2.8.C2a, 1.4.8.CR2a, 2.1.8.CHSS/IV.8.AI.1, W.5.8, 6.1.8.GeoSV.3.a, 6.1.8.CivicsDP.4.b, 7.1.NH. IPRET.8).
9.4.8.IML.12	Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.
	Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and communicating with others.
9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
9.4.8.TL.4	Synthesize and publish information about a local or global issue or event (e.g., MSLS4-5, 6.1.8.CivicsPI.3).
CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technolgy and Design Integration

Technology is fully integrated with the Discovery Techbook

TECH.8.2.8.D.1	Design and create a product that addresses a real world problem using a design process under specific constraints.
TECH.8.2.8.D.2	Identify the design constraints and trade-offs involved in designing a prototype (e.g., how the prototype might fail and how it might be improved) by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook.
TECH.8.2.8.D.3	Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.

TECH.8.2.8.D.CS1	Apply the design process.

Interdisciplinary Connections

LA.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
LA.RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
LA.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
LA.RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
LA.RST.6-8.5	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
LA.RST.6-8.6	Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
LA.RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
LA.RST.6-8.10	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
LA.WHST.6-8.1	Write arguments focused on discipline-specific content.
LA.WHST.6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.6-8.4	Produce clear and coherent writing in which the development, organization, voice, and style are appropriate to task, purpose, and audience.
LA.WHST.6-8.5	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
LA.WHST.6-8.6	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
LA.WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
LA.WHST.6-8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
LA.WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research.
LA.WHST.6-8.10	Write routinely over extended time frames (time for research, reflection, metacognition/self correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
TECH.8.1.8.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.8.D	Digital Citizenship: Students understand human, cultural, and societal issues related to

	technology and practice legal and ethical behavior.
TECH.8.1.8.F	Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.8	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Differentiation

Struggling Students	ELL	Accelerated Students
1. Ask students to use a two-column chart to compare and contrast two different examples of food webs. 2. Provide students with an image of a food web and a food chain on the whiteboard. Leave these images up throughout the videos to give students a visual while they are filling in their Venn diagrams.	1. Assist students in identifying familiar prefixes and/or words within words for each glossary term (e.g. *niche* is from the Latin word *nicher*, which means "to create a nest"). 2. Encourage students to demonstrate their understanding by drawing concepts. For example, they can create their own food chains, food webs, and energy pyramids to explain how energy moves through an ecosystem.	1. Before they read the Core Interactive Text, have students use their previous knowledge of organism relationships to describe how they think organisms depend on one another. Provide a hint to students to remember that plants are organisms. 2. Using their current knowledge of plants, have students explain what role plants play in the environment other than providing energy. Have students discuss the carbon cycle and the cycling of nutrients. 3. Ask students to select a keystone species from their local ecosystem and have them justify why they choose the organism.

Differentiation in science can be accomplished in several ways. Once you have given a pre-test to students, you know what information has already been mastered and what they still need to work on. Next, you design activities, discussions, lectures, and so on to teach information to students. The best way is to have two or three groups of students divided by ability level.

While you are instructing one group, the other groups are working on activities to further their knowledge of the concepts. For example, while you are helping one group learn the planet names in order, another group is researching climate, size, and distance from the moon of each planet. Then the groups switch, and you instruct the second group on another objective from the space unit. The first group practices writing the order of the planets and drawing a diagram of them.

Here are some ideas for the classroom when you are using differentiation in science:

- Create a tic-tac-toe board that lists different activities at different ability levels. When students aren't involved in direct instruction with you, they can work on activities from their tic-tac-toe board. These boards have nine squares, like a tic-tac-toe board; and each square lists an activity that corresponds with the science unit. For example, one solar system activity for advanced science students might be to create a power point presentation about eclipses. For beginning students, an activity might be to make a poster for one of the planets and include important data such as size, order from the sun, whether it has moons, and so on.

- Find websites on the current science unit that students can explore on their own.

- Allow students to work in small groups to create a project throughout the entire unit. For example, one group might create a solar system model to scale. Another group might write a play about the solar system. This is an activity these groups can work on while they are not working directly with you.

Differentiation in science gets students excited to learn because it challenges them to expand their knowledge and skills, instead of teaching the whole group concepts they have already mastered.

Modifications & Accommodations

Refer to QSAC EXCEL SMALL SPED ACCOMMOCATIONS spreadsheet in this discipline.

Modifications and Accommodations used in this unit:

IEP and 504 Accommodations will be utilized.

In addition to differentiated instruction, IEP's and 504 accommocations will be utilized.

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every quarter or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

Aimsweb benchmarks 3X a year

Linkit Benchmarks 3X a year

Additional Benchmarks used in this unit:

The students will complete two summative benchmark tests administered by the teacher via Google Forms and Google Classroom. There is one benchmark test administered in the middle of the year around January, and a second one administered in May.

Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

Formative Assessments used in this unit:

See assessments located in the unit link above

Students will create a poster showing different types of interactions among organisms.

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

See assessments located in the unit link above within Teach TCI resources.

Paper and digital tests will be implemented. Summative tests will be designed by the teacher via Google Forms, Google Docs, and Microsoft Word.

Instructional Materials

See materials located in Unit above through TeachTCI Resources.

Standards

MS-LS2	Ecosystems: Interactions, Energy, and Dynamics
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. Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.
MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.
MS-LS4	Biological Evolution: Unity and Diversity
MS-LS4-2	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures. Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events.
LS4.A	Evidence of Common Ancestry and Diversity Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent. Patterns Patterns can be used to identify cause and effect relationships.