

Kit Alignment Activities

8th Grade

Investigating Biodiversity and Interdependence

Correlation of Objectives

The activities in this kit investigate classification and examination of the micro-world. It examines the structure and function of micro-organisms, focusing on characteristics of what defines a living organism and how they survive within their micro-ecosystems. It provides investigations that directly reflect learning about the structure and behavior of bacteria, viruses, and especially protists and fungi. Students create a pond habitat where students examine abiotic and biotic factors and discuss predator-prey relationships. They facilitate taking a close look at organisms like WOW bugs, blackworms, and microbes like Ameboids, Ciliates, Daphnia and hydra, fungi and yeast.



The kit is full of informational text selections that make connections from the micro- to the macro world where students will be able to (8.L.3.1) explain how factors such as food, water, shelter, and space affect populations in an ecosystem. (8.L.3.2) Summarize the relationships among producers, consumers, and decomposers including the positive and negative consequences of such interactions including: • coexistence and cooperation • competition (predator/prey) • parasitism • mutualism and (8.L.3.3) Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide, and oxygen). **This makes reading the suggested reading selections imperative to provide instruction that truly reflects the 8th grade science standards identified for this kit.**

Lesson 1

Text Selection: "That's Life" p. 7

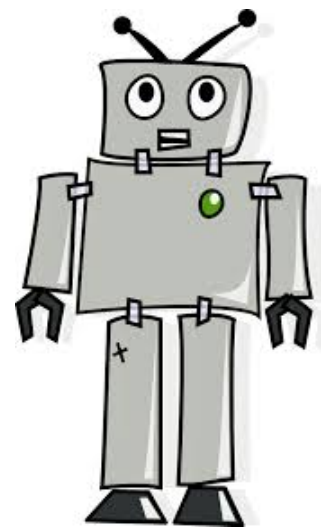
Student Discussion: Is a thermostat alive? Are crystals alive?
Is a robot alive? How do you know?
Can any of the above Grow? Move? React to their environment?
What clearly defines the difference between a living or nonliving thing?

Read to find out: “That’s Life” on page 7 to determine this.

After reading: Either list and illustrate the characteristics of a living thing. Choose one of the three examples from before reading and list reasons why it is not a living thing.

Example List: Living Things

- composed of at least 1 cell
- carry out life processes
- reproduces
- grows
- responds to it’s environment
- A robot is not composed of cells,
- it does not grow or reproduce, therefore it is not living.



Write: What do you think is the easiest way to determine the difference between living and non-living things?

Lesson 1

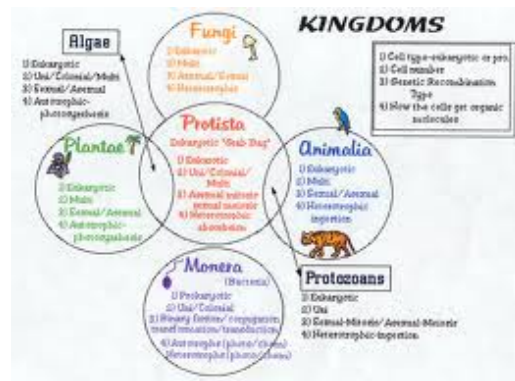
Text Selection: “What’s in an Organism’s Name?” p. 10

Activity: (Foundation for 8.L.3.2) –Structure and behavior of protists

Student Discussion: See seven-layer system chart on p. 13. Make an enlarged copy with the name of the animal cut off the top and each cut into strips. Allow students to work with a partner or in a group of 3 to guess the name of the animal by just reading the classification information. Share out with the group and explain conclusions.

Read to find out : about how organisms are classified, the two main kingdoms, and what kinds of organisms are classified in the other kingdoms.

After Reading: Assign small groups pictures of the microbes they will be examining the remainder of the kit, and ask them to predict the kingdom in which they would classify them and a justification for their prediction.



Lesson 2

Text Selection: "Intriguing Insects" p. 32

Activity: (Foundation for 8.L.3.2) – structure and behavior of parasites– affects of losing one organism in an ecosystem.

Student Discussion: Are insects good guys or bad guys? What is a parasite? Is a parasite a good or bad thing?

What do you think the world would be like without parasites?
Justify your answer for each.

Read to find out: “Intriguing Insects” to find text evidence to justify your answers.



After Reading: Write a response that tells what your initial responses were to the discussion questions and what evidence in the text either supported your initial answers or changed your mind and why.

Lesson 2

Text Selection: “Dr. Matthews and the WOW Bug” p.

Activity: (Foundation for 8.L.3.2) parasitic relationships

Student Discussion: Why do you think a WOW bug is? Why do you think it might be called a WOW bug? Do you think it is a parasite? Do you think they would be safe to study? Justify your thinking for each question.

Read to Find Out: About the WOW bug and the answers to your predictions.

After Reading: Write a response that tells what your initial responses were to the discussion questions and what evidence in the text either supported your initial answers or changed your mind and why.



Extension:

Compare and contrast a Bee to a WOW bug to compare a parasitic relationship to mutualism of bees and flowers.

Write: Research other Parasites : Tick, Flea, Leech, etc.

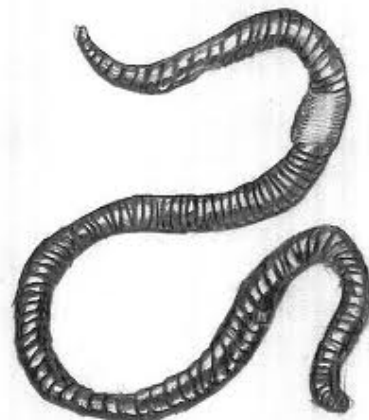
Lesson 3

Text Selection: “More Than Just Bait” p. 49

Activity: (8.L.3.2) Decomposers contribute to ecosystems

Student Discussion:

Can you name an animal that would be classified as a decomposer? How do decomposers contribute to an ecosystem? What would happen if decomposers were removed from an ecosystem? Can decomposers regenerate?



How do you know? What does this mean?

Read to Find Out: Read “More than Just Bait” to find evidence to justify your responses.

After Reading: Write a response that tells what your initial responses were to the discussion questions and what evidence in the text either supported your initial answers or changed your mind and why.

Lesson 4

Text Selection:

“Even a Habitat Has to Live Somewhere” p. 60

Activity: (8.L.3.2) *Characteristics of Habitats and Ecosystems*

Student Discussion: What’s the difference between a habitat and an ecosystem?

Read to Find Out: *The characteristics that make a habitat different from an ecosystem.*

After Reading: Work in small groups to identify at least three

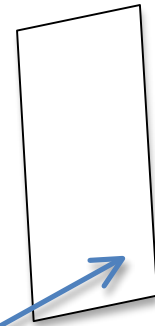
| | |
|--|--|
| | |
|--|--|

differences between habitats and ecosystems.

Extension: Create a compare and flip book to compare and contrast the characteristics of habitats and ecosystems. With labels on the outside, characteristics on the inside.

OR

Choose one of the ecosystem examples from the text and illustrate the interactions of organisms within it that make it an ecosystem. (strand of trees, ocean, freshwater rivers, etc.)



Lesson 5

Text Selection:

“Even a Habitat Has to Live Somewhere” p. 60

Activity: Roles within ecosystems

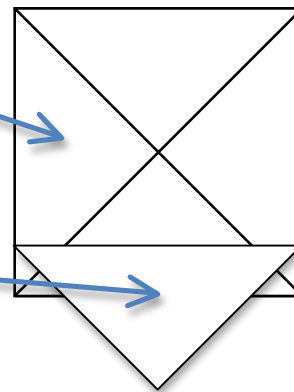
Student Discussion: What kinds of changes occur within ecosystems? What kinds of things cause these changes? What is the difference between biotic and abiotic factors within an ecosystem? Do niches cause these changes?

Read to Find Out: The causes and effects of changes within an ecosystem. Which of those are biotic and abiotic? What is a niche?

After Reading: Discuss answers to these questions with partners, then groups of four, followed by class discussion.

Extension: Create an ecosystem four flap flip titled "Ecosystems Change"

Each of the four flaps labeled: Biotic Factors, Abiotic Factors, Human Factors, Niches. Under each flap, give an example of how each of these contribute to change in ecosystems.



Lesson 5

Text Selection: "Who Eats Whom?" p. 76

Activity: Producers/consumers autotrophs/heterotrophs/
Food Webs

Student Discussion: Which of the following statements do you think are true?

- All food contains stored energy from the sun
- Fungi and Bacteria are Heterotrophs
- Yogurt is the product of bacteria that eat milk
- A Viper would be great pest control for your home
- Millipedes, Mushrooms and Molds are decomposers
- Heterotrophs can survive without Autotrophs
- Every food that you eat relies on autotrophic organisms

Read to Find Out: Read "Who Eats Whom" to find evidence to justify your responses.

After Reading: Write a response that tells what your initial responses were statements and what evidence in the text either supported your initial

| |
|------------|
| Producer |
| Consumer |
| Decomposer |
| |

answers or changed your mind and why.

Extension Activity: Students create a layered food chain flip with label and illustration on the outside flap, and description on the inside flap.



Lesson 6

Text Selection: “ The Art of Naming Organisms” p. 82

Activity: Protists–eukaroytes

Student Discussion: What do you think Amoebas, Paramecium, Euglena and Volvox all have in common?

Read to Find Out: What Amoebas, Paramecium, Euglena and Volvox all have in common?

After Reading: Discuss what the four have in common and identify the characteristics that make them different. This could include the teacher reading a characteristic of one and students determining which eukaryote describes.

Extension: With a partner choose one of the four eukaryotes to illustrate, label, describe and tell the significance of.

Lesson 6

Text Selection: “Bacteria Friends or Foes” p. 90

Activity: (8.L.1.1 & 8.L.1.2) Is Bacteria harmful or helpful?

Student Discussion: *What do you know about bacteria? Do you think they are helpful or harmful? Divide into two teams– helpful or harmful.*

*What do you think this number represents?:
60,000,000,000,000,000,000,000,000*

Read to Find Out: Find text evidence to support your team’s conclusion and to find out what this number represents.

After Reading: Meet with your team to share evidence you found to prepare to debate your findings with the other team’s findings. Allow teams to discuss and debate between teams, citing evidence in their text.

Extension: Create an advertisement that communicates whether bacteria are harmful or helpful including an attention catching title, 4 bulleted reasons to persuade the reader, an illustration and a closing statement.

Write: a description of the purpose of the advertisement and why you created it with your perspective.

Lesson 6

Text Selection: “Mighty Microbes” p. 93

Activity: (8.L.1.1 & 8.L.1.2) Prokaryotes and Eukaryotes; Protists; Microscopic animals; Virus vs bacteria; Causing diseases– make connection to epidemic and pandemic (small vs large population)

Student Discussion: What do you know about microbes? Is a virus a microbe? Is a virus alive?

Read to Find Out: at least three interesting facts about microbes and answers to these questions.

After Reading: Wander around the room and make contact with at least three people. Share your facts with each person. Put a checkmark next to any that are the same, and steal only one fact from each person. After wandering, you should return to your desk with a total of 6 facts. Discuss findings with the class and determine the most popular/interesting discoveries based on the number of checkmarks.

Extension: Create a four fold fan-fold about microbes. Where you fold about a 1–2 inch fold at the top of the paper, and continue folding the paper back to make a fan effect that creates 4–6 surfaces to write on. The top fold should be titled “Microbes” and each of the following folds should have interesting details about each written on them.

Write: Explain why viruses are classified as microbes even though they are not alive.

Lesson 7

For animal research, be sure to focus on:

- Habitat (objective)
- Role in Ecosystem
- Adaptations

Lesson 7:

Text Selection: "Daphnia's Change of Appetite" p. 106

Student Discussion: How do you know when food has turned bad and you should not eat it? What you do if all your food turned bad and you had nothing left to eat?

Read to Find Out: This happened to a tiny creature called Daphnia. Read to find out what happened to it.

After Reading: Get with a partner and talk about what was surprising about the survival of the Daphnia. Share discussions with the group citing text evidence.

Write: Imagine you are a Daphnia, tell your remarkable story including what happened to your food source, and how your kind adapted in order to survive. Include an illustration.

Lesson 7:

Text Selection: "Habitats as Homes" p. 109

Activity: (8.L.4.1, 8.L.4.2) Parasitic relationships, Populations adapt and evolve, adaptation, migration, ecosystems.

Student Discussion:

True or False:

A habitat can be an animal's intestine

An ecosystem can be the size of a drop of water

**Sea Turtles' Habitat is in the ocean

**Salmon's Habitat is in salt water

Human's impact habitats

Individual organisms do not adapt and evolve

Read to Find Out: Text evidence to prove whether each of these statements is true or false.

After Reading: Discuss your decisions and evidence with a partner. Share your opinions and evidence with the group.

Write: Explain why two of the statements are not completely true or false. **

Lesson 8:

When looking at ponds, label the biotic and abiotic components. Observe the microbes in the pond.

Text Selection: "The Changing Pond" p. 121

Activity: Food Web; Classify types of relationships

Student Discussion:

Agree or Disagree with the following statements:

Natural ponds begin by accident

Sunlight can reach the bottom of most ponds

Microbes are dormant in cysts to protect themselves

All ponds eventually complete the process of succession

The process of succession is a cycle that repeats itself over and over again.

Read to Find Out:

Explore the reading selection to determine which of the statements are true and find text evidence to support their decision.

After Reading:

Examine the picture of the food web on p. 123. Create a layered flip book illustrating a food web with the Detritus labeled and defined on the bottom flap, with each layer going up another step in the food chain of the pons ecosystem with an illustration, example, and description of each. (See example below)

Extension: Write an explanation of what the food chain flip books represents.

Lesson 10:

Text Selection: “Jellyfish Get a Bad Rap” p. 144

Activity: (8.L.3) Predator/prey relationships

Student Discussion:

Look at title? Do you agree? What do you think selection will be about?

True or false? - Jelly fish is not really fish at all.

Most Jellyfish do not intentionally sting people

Jelly Fish can sting even after they are dead

Jellyfish have no brain, heart, blood, bones, eyes, ears or gills

Jellyfish have been around longer than dinosaurs

Jellyfish are predators and prey

Coral Reefs are endangered because of climate change

Jellyfish are making adaptations in order to survive

Human activities that affect Jellyfish are causing problems for humans.

Read to Find Out:

Create a four flap flip book, choosing four of the statements to investigate to prove to be true or false. Write each of those statements on the outside. Students explore the reading selection and as they find text evidence, write “true” or “false” under each flap with an explanation of their answer including text evidence.

After Reading:

Students find a partner and get back to back. Teacher says “flip” and students face each other share their findings for one of the statements illustrated and explained from their flip book. Teacher says “flop” and students turn back to back again. Teacher continues Flip-flop activity 2 more times before students find a different partner and continue the activity.

Extension:

Students write an explanation of the last two statements about how JellyFish are having to adapt due to human activities, and their adjustments and changes then in turn, affect humans.

Lesson 11: “There’s a Fungus Among Us”

Activity: Investigating helpful and harmful fungi; parasitic relationships

Student Discussion:

What is your initial impression of Fungi? Positive or negative? Why do you think that is? Which of these statements about fungi do you think are true?

Read to Find Out:

Fungi cannot capture nor make their own food
Fungi can be deadly as well as essential to an ecosystem’s survival
There are 1.5 thousand different species of fungi.
Fungi break down organic material to get the nutrients they need.
Black bread mold is a type of fungi.
Spores from mushrooms germinate and grow almost anywhere they land
Some fungi survive by forming symbiotic relationships
Some fungi survive by forming parasitic relationships
Fungi have many useful roles

After Reading:

Explore to find answers– compare and contrast foldable– bad and good of mold

Extension:

Write an explanation of what the flip book shows.

p. 164 yeast

p. 172 tropical rainforest