

Ecology: The Ebb and Flow of Natural Systems

Name:

Teacher:

Class:

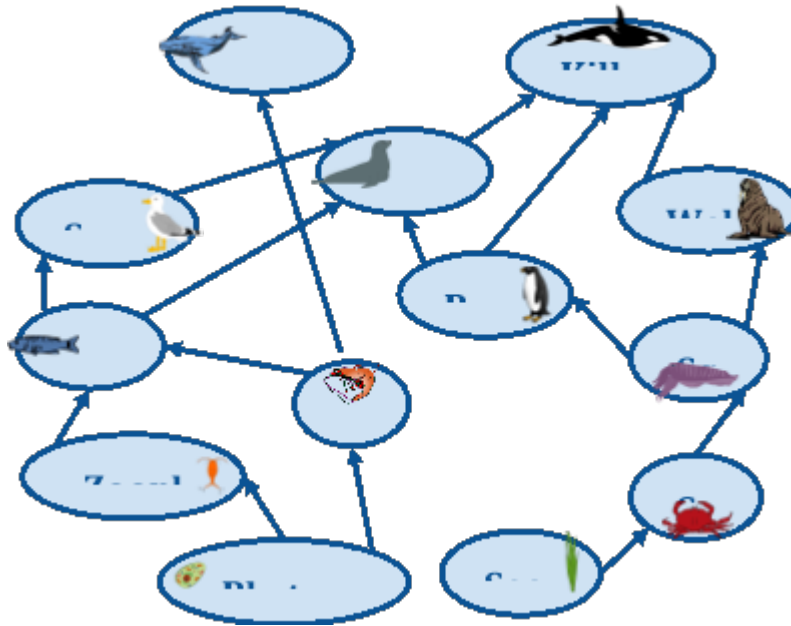
Life Science (Lower Middle)

Unit 4

Exit Tickets

Lesson 3 Exit Ticket: What's for Dinner

Below is a food web that represents the feeding relationships in an aquatic ecosystem.



- Based on your knowledge of science and the food web above, fill out the table below with what type of organism is listed (producer or consumer) and what its source(s) of energy are. [4]

Organism	Type of Organism	Source(s) of Energy
Seal		
Seaweed		

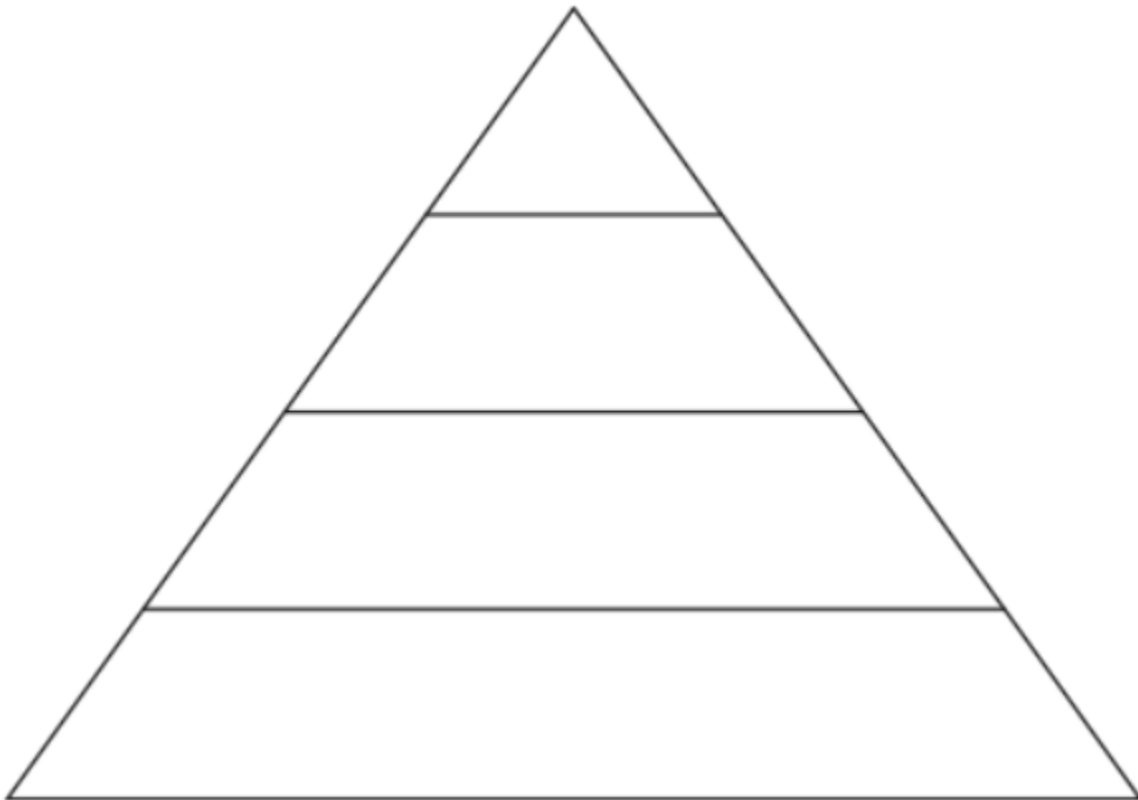
- Marine worms are one type of decomposer that exist in aquatic ecosystems. If the marine worm was added to the food web above, what would be its source of energy? Explain using your knowledge of science to support your response. [2]

Lesson 4 Exit Ticket:

The Great Pyramids: Energy and Matter Flow

Directions: Revise your ecological pyramid of the campsite ecosystem using your Lab Notebook and your knowledge of science. Be sure to include the following in your model:

- Labels for each part of the pyramid
 - The type of trophic level (1–4) [1]
 - The type of organisms that make up that level:
 - Autotrophs [1]
 - Heterotrophs [1]
 - Primary consumers
 - Secondary consumers
 - Tertiary consumers
 - Organisms from the campsite ecosystem that make up each level [1]
 - An arrow that represents the direction of energy flow [1]



Lesson 5 Exit Ticket: Feast or Famine?

A group of ecologists were studying the different predator–prey relationships of a desert ecosystem over a 15-year period.

1. Using the prediction of predator populations over the 15-year period, complete the graph by finishing the “Prey” curve through year 15. [1]

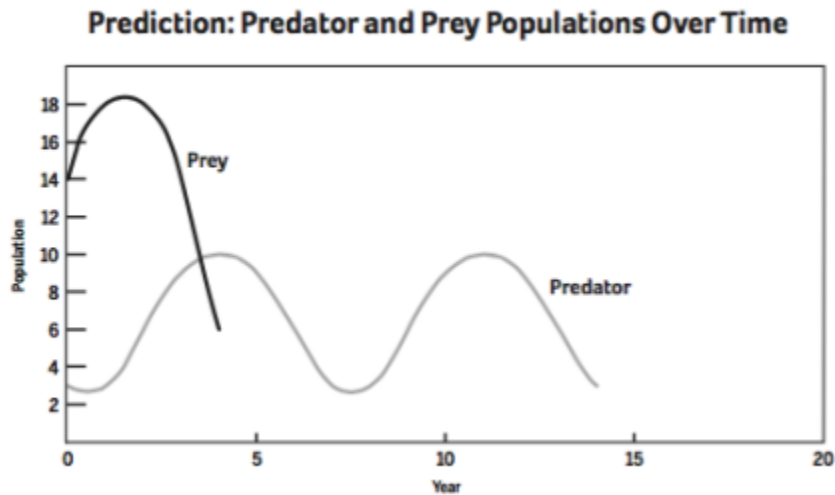


Image and question adapted from Chapter 1: Wolves in Yellowstone in [Disruptions in Ecosystems from NGSS Lead States](#). 2013. Next Generation Science Standards: For States. Washington, DC: The National Academies Press.

The ecologists had different ideas of what would happen if another predator entered the ecosystem:

Dr. Eco Logylocks: “The addition of another predator would decrease the amount of resources available for other organisms.”

Dr. Fauna Matters: “More predators means more competition among the predators!”

Dr. Herb Ivorous: “If we add more predators, the populations in the ecosystem will decrease significantly!”

2. Which ecologist is the most scientifically accurate? Explain using your knowledge of science to support and justify your response. [3]

Lesson 6 Exit Ticket:

The Crittercam Files: Ecological Relationships

A species of sea slugs called *Melibe engeli* feed on hard and soft corals. Some algae, photosynthetic organisms, live on hard and soft corals. When the sea slugs ingest their food, they keep the algae alive and move them to special parts of their bodies. When the algae undergo photosynthesis, the sea slugs receive the products, and in return the algae receive protection and nitrogen (an essential nutrient that promotes growth in organisms). Additionally, the chlorophyll found in the chloroplasts of the algae give the sea slugs a green color, which helps to camouflage them in their environment.

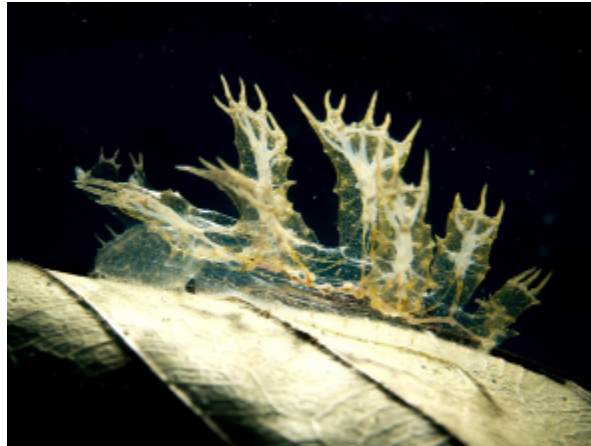
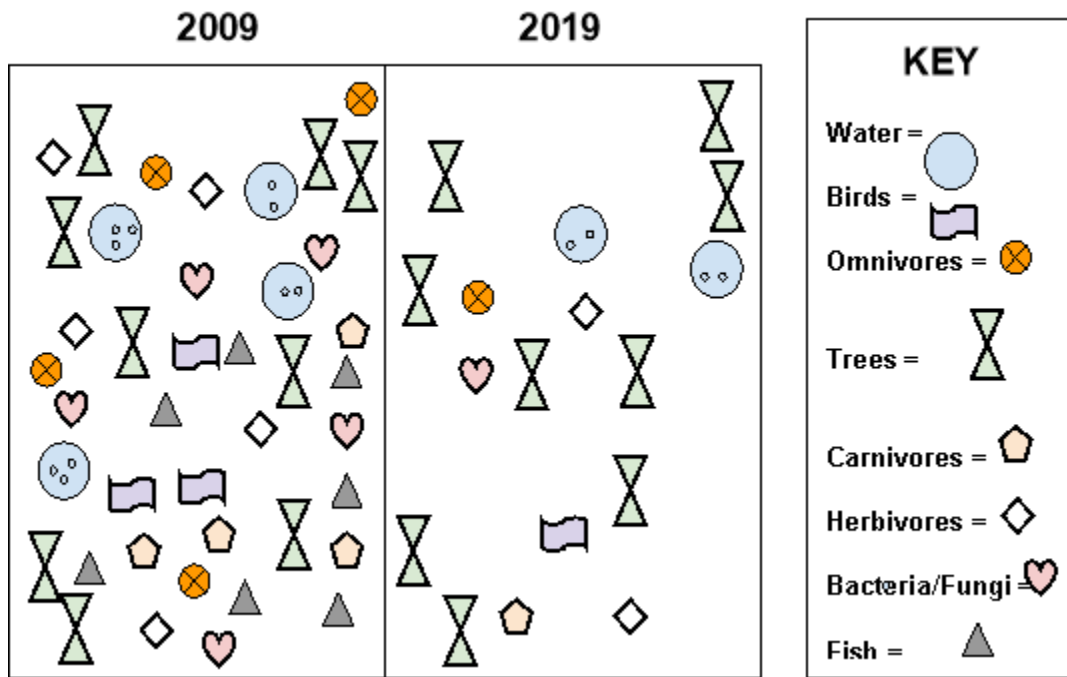


Image credit: [Rickard Zerpe, CC BY-SA 2.0](#), via Wikimedia Commons

1. What type of symbiotic relationship do sea slugs and algae share? [1]
 - A. Parasitism
 - B. Mutualism
 - C. Commensalism
2. Explain and justify your response. Include evidence to explain *both organisms* in the relationship. [2]

Lesson 7 Exit Ticket: Time for a Checkup: Ecosystem Health

The following model shows how a tropical rain forest ecosystem has changed in the last ten years.



Note: Each symbol represents a population of that type of organism found in the ecosystem.

A tourism company located near the rain forest released the following statement:

“Unfortunately, the rainforest ecosystem is experiencing a decline in its health and cannot have any visitors.”

Exit Ticket continues on next page!

Lesson 7

1. Evaluate the accuracy of the company's statement. Explain using evidence from the model and your knowledge of *biodiversity* to support and justify your response. [3]

2. Which is the correct sequence that leads to biodiversity in an ecosystem? [1]

- A. Biodiversity → genetic variation → unique adaptations
- B. Genetic variation → unique adaptations → biodiversity
- C. Unique adaptations → genetic variation → biodiversity
- D. Genetic variation → biodiversity → unique adaptations

Lesson 8 Exit Ticket: Succeeding in Succession

There was a large volcanic eruption, and a thick cloud of ash blocked most sunlight from reaching the ecosystem for several months. Below are three statements on what will happen to the ecosystem:

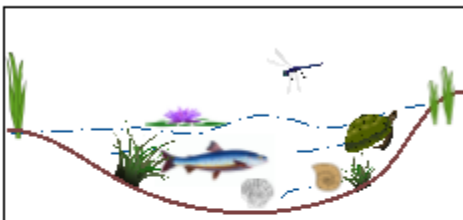
I. The producer population will increase.
II. All trophic levels will be negatively affected but not completely eliminated.
III. The ecosystem will experience primary succession.

1. Which statements above are true? Circle the best answer below. [1]

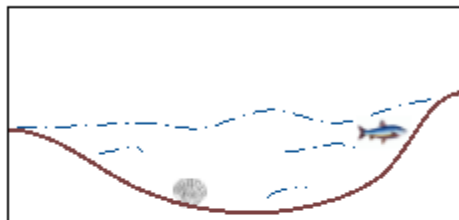
- A. I
- B. II
- C. III
- D. Only I and II
- E. Only II and III

As the ecosystem recovered from the volcanic eruption, ecologists studied the organisms in the same pond. Each pond represents a year following the eruption.

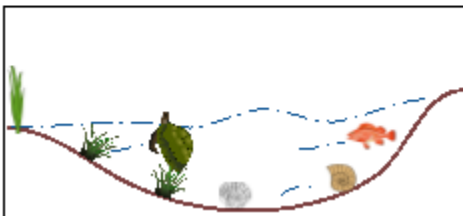
Pond A



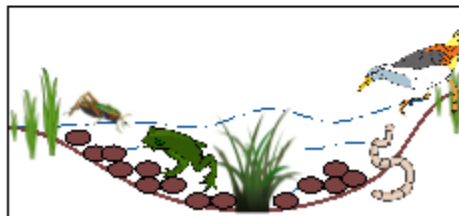
Pond B



Pond C



Pond D



Exit Ticket continues on next page!

Lesson 8

2. Order the pond pictures from oldest (closest to volcanic eruption) to youngest (closest to present day) by writing their letter on lines below. [2]

Oldest → Second Oldest → Second Youngest → Youngest

Lesson 9 Exit Ticket: Chaotic Campsite

The table below shows the population of deer in a grassland ecosystem over a period of eight years. Use the information below and the table to help you answer the questions that follow.

- At the end of year 3, 80 percent of the grassland is converted to farmland and fenced to keep the deer out.

Year	Deer Population	Average Mass of Deer (kg)	Number of Deer Births	% Malnourished (Severely Underweight) Deer
1	100	30	30	5
2	97	29	25	4
3	105	31	15	3
4	83	29	5	46
5	57	27	7	32
6	56	23	6	25
7	58	20	8	18
8	58	20	5	10

Question adapted from Chapter 3: Interactions Between Populations and Resources in [Disruptions in Ecosystems from NGSS Lead States](#). 2013. Next Generation Science Standards: For States. Washington, DC: The National Academies Press.

When asked about the impact of the farmland and fencing, farmers stated the following:

“This change will be beneficial for the deer population.”

1. Do you agree with this statement? (Circle one) **Yes** or **No** [1]

2. Use two pieces of evidence from the data table to write two different statements that each includes both evidence and justification that scientists could use to *refute* the farmers’ claim. [2]

Evidence & Justification 1:

Evidence & Justification 2:
