

# Flow of Energy through Living Systems

StemScopes: Parts 1-4  
Reflection & Conclusion



# Background

## 1. What is a food chain?

A food chain is the path of energy from one organism to another in an ecosystem.



# Background

2. What do the arrows represent in a food chain?

The arrows indicate the flow of energy from one organism to another in a food chain.



# Background

3. Where do organisms get the energy they need to survive?

Organisms get the energy they need to survive either from the Sun or from eating other organisms.



# Background

## Producers:

- organisms, such as plants that use radiant energy from the Sun, carbon dioxide from the air, and water from the soil to produce its own food.



# Background

## Primary Consumers:

- A consumer eats producers to obtain energy, which are herbivores that eat plants



# Background

## Secondary Consumers:

- A consumer eats other consumers to obtain energy, which are carnivores that eat other consumers.

# Background

## Decomposers:

- Breakdown dead bodies of both plants and animals; get their energy from the cells of plants and animals. They turn the remains of the plants and animals into nutrients, which are released into the soil.



# Background

## 4. What is a food web?

Food webs show the complex relationships of the energy flow in an ecosystem that contains a variety of producers and consumers.



# Part 1: Diagram the Energy Flow Through a Food Chain

1. Draw a diagram of the model you created that shows how energy flows through a food chain. Use arrows to show the energy path flowing from one organism to another.
- Food chain will vary by ecosystem and the organisms selected within each ecosystem.  
**Example: Sun→Grass→Wildebeest→Lion→Fungi**

# Part 1: Diagram the Energy Flow Through a Food Chain

2. Use the information on the organism cards to list the parts of your food chain below.
  - Food chain will vary by ecosystem and the organisms selected within each ecosystem.  
**Example: Sun = energy source, Grass=producer, wildebeest=primary consumer (herbivore), Lion=secondary consumer (carnivore), and Fungi=decomposer.**
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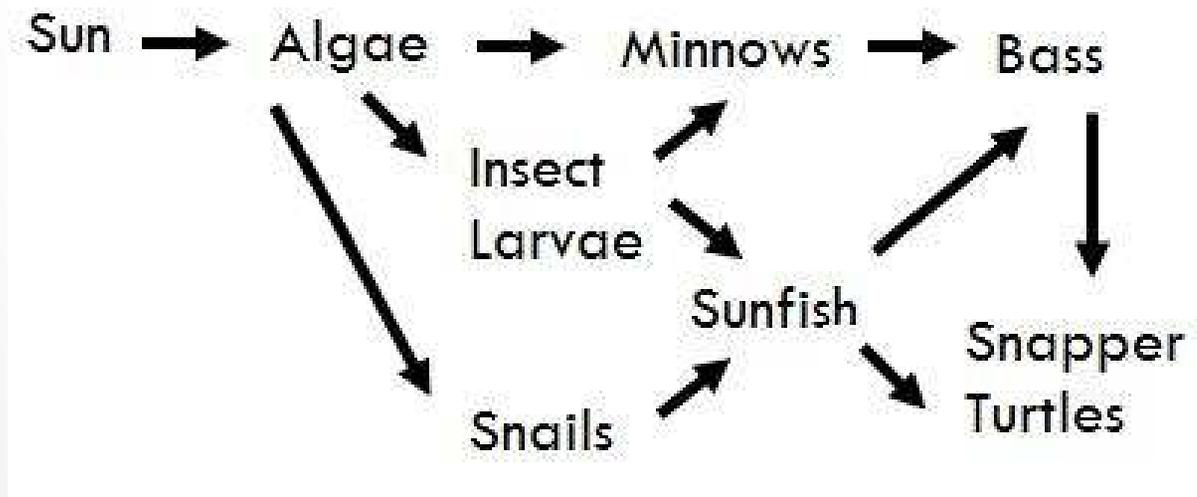
# Part II: Comparison Table

- All squares should be filling in.



# Part III: Diagram the Energy Flow Through a Food Web

- Draw a diagram of the model you created that shows how energy flows through a food web. Use arrows to show the energy path flowing from one organism to another. Include a legend to provide details about color representation. For example: the green lines show energy flowing from plants.



# Part III: Diagram the Energy Flow Through a Food Web

1. What do the lines represent in your food web model?

The energy flow from one organism to another



# Part III: Diagram the Energy Flow Through a Food Web

2. What is the role of a decomposer in a food chain or web?

A decomposer breaks down animals remains and waste into molecules that producers reuse to make energy.

# Part III: Diagram the Energy Flow Through a Food Web

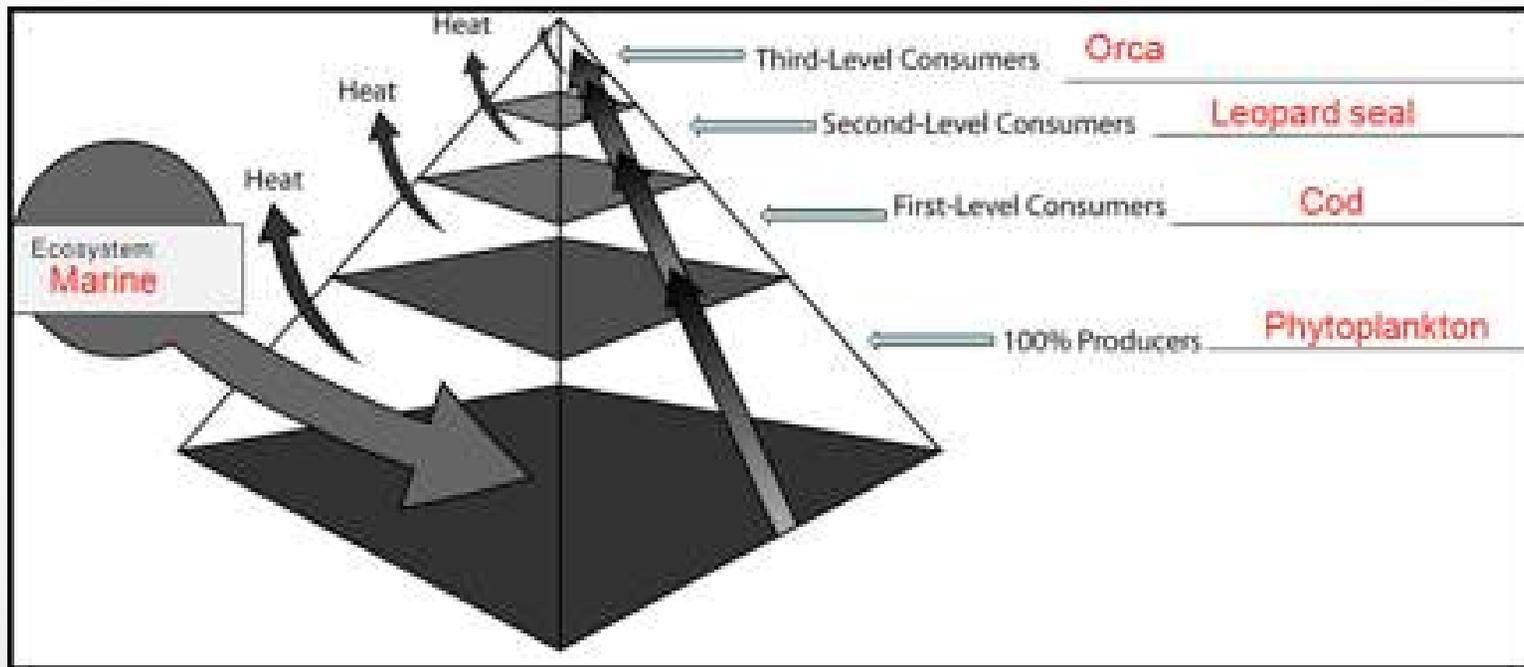
3. How many different relationships did you discover in your food web model? Describe.

Producer/consumer; consumer/consumer;  
consumer/decomposer;  
producer/decomposer



# Part IV: Diagram the Energy Flow Through an Energy Pyramid

- Complete the blanks on the diagram below using organisms from your ecosystem to demonstrate how energy transforms in an energy pyramid.



# Part IV: Diagram the Energy Flow Through an Energy Pyramid

2. Fill in the blanks to complete these statements:

In my **marine** ecosystem, if the **phytoplankton** contributes 1,000 calories, then the **cod** receives **100** calories. Of these **100** calories only **10** calories are transferred to the **leopard seal**. Finally, only **1** calorie is available from the original 1,000 for the **orca** as a third level consumer.

# Part IV: Diagram the Energy Flow Through an Energy Pyramid

- **1 calorie:** Third Level Consumer
- **10 calories:** Second-Level Consumer
- **100 calories:** First-Level Consumer
- **1,000 calories:** 100% Producer

# Reflections and Conclusions

1. What is the difference between a food chain and a food web?

A food chain shows one possible flow of energy for an organism, while a food web shows the energy flow and relationships of organisms in an ecosystem.

# Reflections and Conclusions

2. What information does a food web show that is not demonstrated on an energy pyramid? What is demonstrated more clearly on an energy pyramid when compared to a food web?

Energy pyramids clearly show how the amount of energy decreases as it flows from producers at the bottom of the food chain to tertiary consumers at the top of the food chain. A food web demonstrates energy flow and the different relationships within an ecosystem.

# Reflections and Conclusions

3. What would happen to the ecosystem if a disease killed off all of the decomposers in your chosen ecosystem?

The bodies of dead organisms would not decompose and would litter the ground; the nutrients in their bodies would not be broken down and returned to the soil, and the producers would not have the nutrients they need for healthy growth. The number of producers would decrease, which would then cause the first level consumers, or herbivores, to either die or move to a new area. This would, in turn, affect the second and third level consumers in that they would also either die or move to a new area to look for food.



# Reflections and Conclusions

4. Choose one organism to remove from your chosen ecosystem. How would that organism's absence affect the other organisms in the ecosystem?