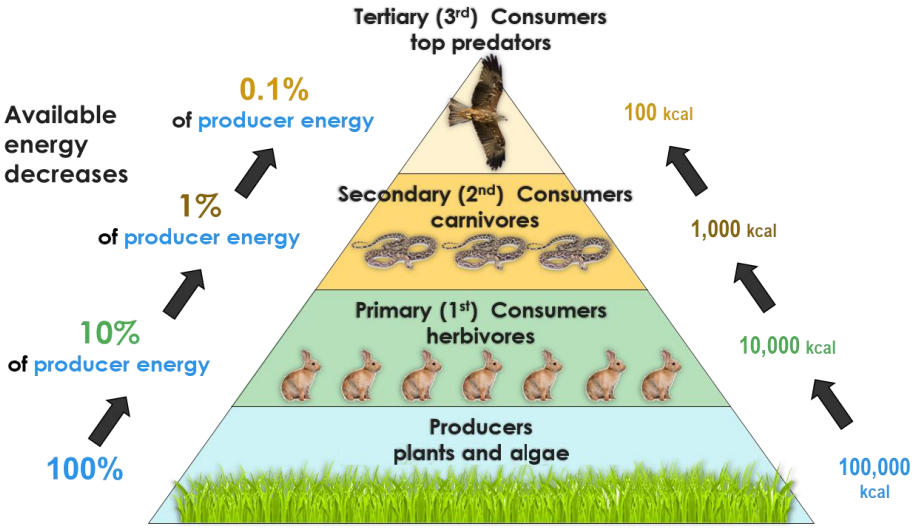
We will determine how energy flows in an energy pyramid. | **Concept Development**

An **energy pyramid** **represents the flow of energy** from the **producer** through various **consumers** at different trophic levels.

► About **90%** of the energy at each level is used for **life processes** and released as heat, or stays in parts that are not eaten.

► The remaining **10%** of the energy is **stored in the organisms' tissues** and can be **transferred** to the **consumers on the next trophic level**.



Life Processes

moving, breathing, maintaining body temperature

CFU

Primary consumer: eats producers.
Tertiary consumer: eats secondary consumers.
Which consumer obtains more energy from the producer (grass)? Explain.

A **Primary Consumer (rabbit)** B **Tertiary Consumer (hawk)**

Secondary consumer: eats primary consumers.
Tertiary consumer: eats secondary consumers.
Which consumer obtains more energy from the primary consumer (rabbit)? Explain.

A **Secondary Consumer (snake)** B **Tertiary Consumer (hawk)**

Primary consumer: eats producers.
Kcal: unit of food energy.
If grass contains 100,000 kcal, how many kcal would a rabbit (primary consumer) receive when it eats the grass? Explain.

A **1,000 kcal** B **10,000 kcal**

In your own words, what is an energy pyramid?

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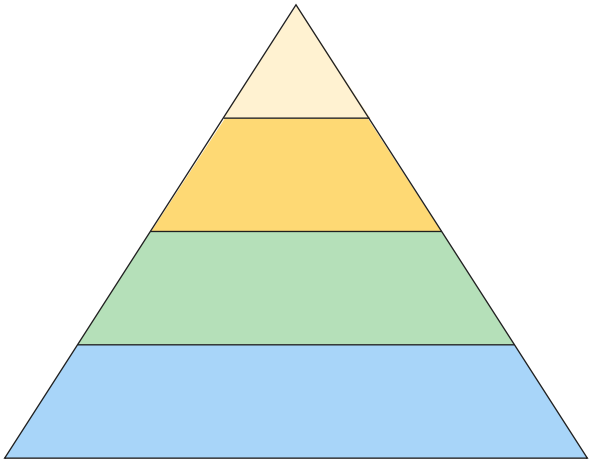
We will determine how energy flows in an energy pyramid. | **Skill Development/ Guided Practice**

1. Identify the producer. (write)
2. Identify each primary, secondary, and tertiary consumer. (write)
3. Place each organism in the proper trophic level on the pyramid. (write)
4. Determine how energy flows in the energy pyramid. (answer questions)

1.

 mouse	 plant	 eagle	 snake

2.



3. Which population contains the *most* available energy?

4. Snakes eat mice that contain 3,000 kcal of available energy. How much energy is transferred to the snakes?

5. 5,000 kcal of energy is transferred from plants to mice. How much energy was stored in the plants?

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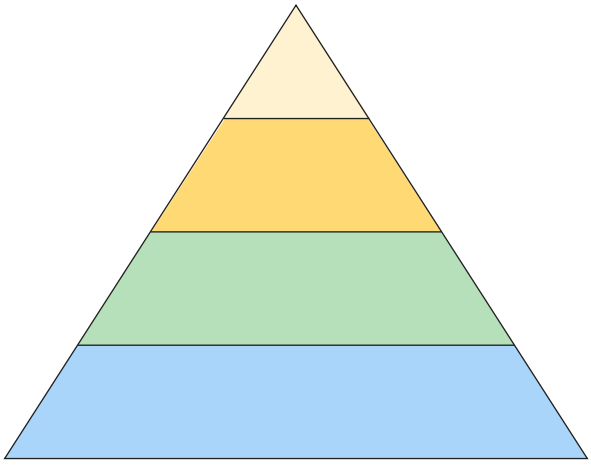
1 Identify the producer. (write)
2 Identify each primary, secondary, and tertiary consumer. (write)
3 Place each organism in the proper trophic level on the pyramid. (write)
4 Determine how energy flows in the energy pyramid. (answer questions)

6.

 fish	 algae	 raccoon	 coyote

7.



8. Which population contains the *least* available energy?

9. Raccoons eat fish that contain 7,000 kcal of available energy. How much energy is transferred to the raccoons?

10. 200 kcal of energy is transferred from raccoons to coyotes. How much energy was stored in the raccoons?

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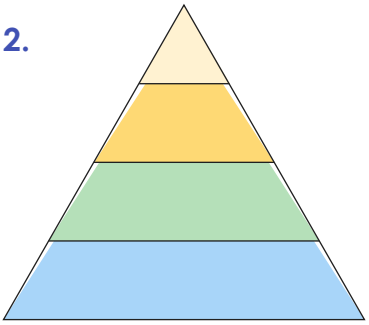
Skill Closure

1 Identify the producer. (write)
2 Identify each primary, secondary, and tertiary consumer. (write)
3 Place each organism in the proper trophic level on the pyramid. (write)
4 Determine how energy flows in the energy pyramid. (answer questions)

1.

			
quail	flowers	grasshopper	fox

2.



3. Which population contains the *most* available energy?

4. Grasshoppers eat flowers that contain 300,000 kcal of energy. How much energy is transferred to the grasshoppers?

5. 110 kcal of energy is transferred from quail to foxes. How much energy was stored in the quail?

Concept Closure

Write an explanation.

Sarah said that 90% of the energy contained in an organism is stored and available to be transferred to the consumer on the next trophic level. Explain why Sarah is incorrect.

Summary Closure

What did you learn today about determining how energy flows in an energy pyramid?

Word Bank

trophic level
organism
producer
primary consumer
secondary consumer
tertiary consumer

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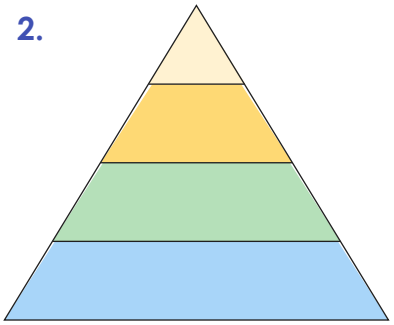
Identify the producer and each level of consumer. Place them in their proper trophic level on the pyramid. Answer how the energy flows.

1.

 flowers	 toad	 alligator	 butterfly

2.



3. Which population contains the *least* available energy?

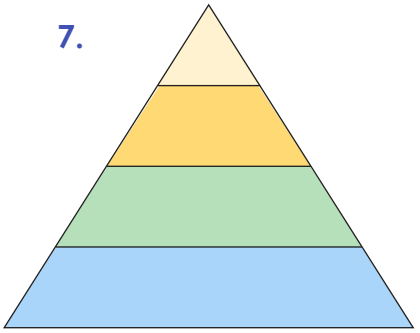
4. Alligators eat toads that contain 400 kcal of available energy. How much energy is transferred to the alligators?

5. 80,000 kcal of energy is transferred from flowers to butterflies. How much energy was stored in the flowers?

6.

 algae	 orca	 shrimp	 seal

7.



8. Which population contains the *most* available energy?

9. Seals eat shrimp that contain 12,000 kcal of available energy. How much energy is transferred to the seals?

10. 950 kcal of energy is transferred from seals to orcas. How much energy was stored in the seals?

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Listening

Listen to each sentence read aloud.
Circle Yes or No for each answer choice.

1. Each trophic level on the energy pyramid shows		
A.	**Yes**	**No**
B.	**Yes**	**No**
C.	**Yes**	**No**
2. When a primary consumer eats a producer,		
A.	**Yes**	**No**
B.	**Yes**	**No**
C.	**Yes**	**No**

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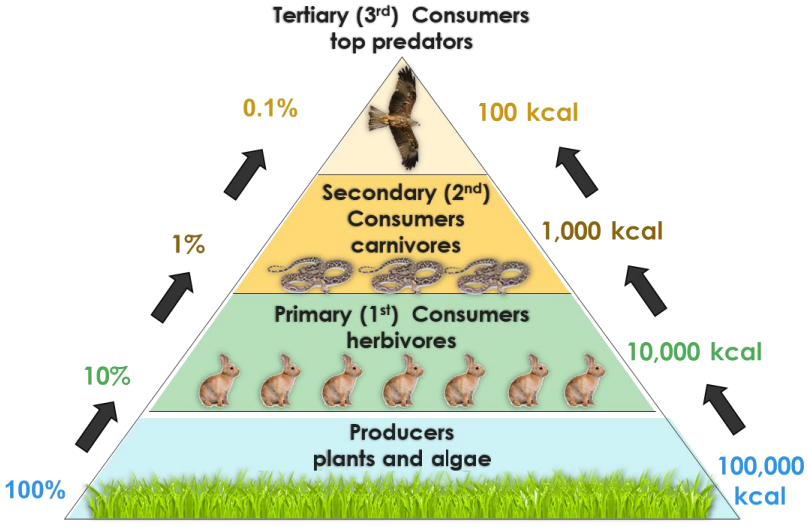
Reading

Read the passage.
Use the text and your knowledge to determine which word belongs in the blank.

10%	consumer	trophic level	energy	90%	pyramid

The energy _____ illustrates how stored energy is passed from one organism to another. At every level in a food web, an organism uses _____ for life processes that help it survive and grow, but much energy is released as heat, usually about _____. At every link in a food web, energy is transferred to the next _____, but typically only _____ of the energy from the previous level is passed on to the _____.



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Writing

Write an explanation.

In the pyramid below, Lee put the organisms in order of how the energy flows through this particular food chain. Why is his answer incorrect? Explain.


orca


sea algae


sea otter


abalone



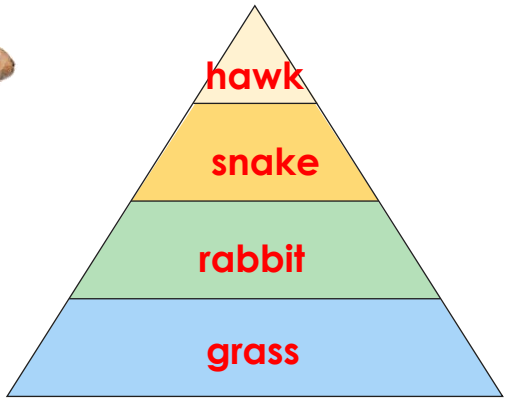
Using the pyramid below, explain how each organism in an ecosystem would be affected if the species in the tertiary level were endangered or extinct.

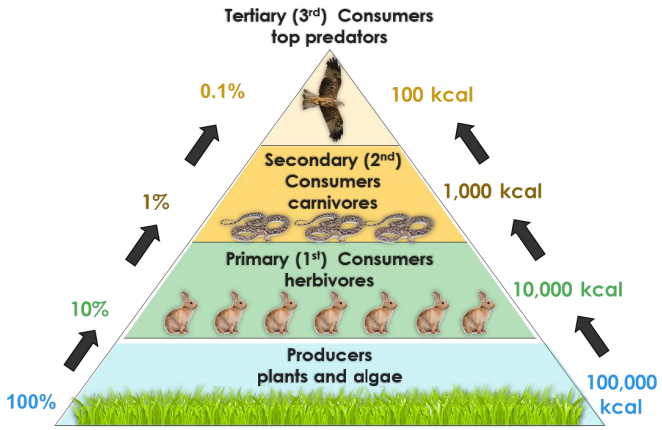

grass


snake


hawk


rabbit





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