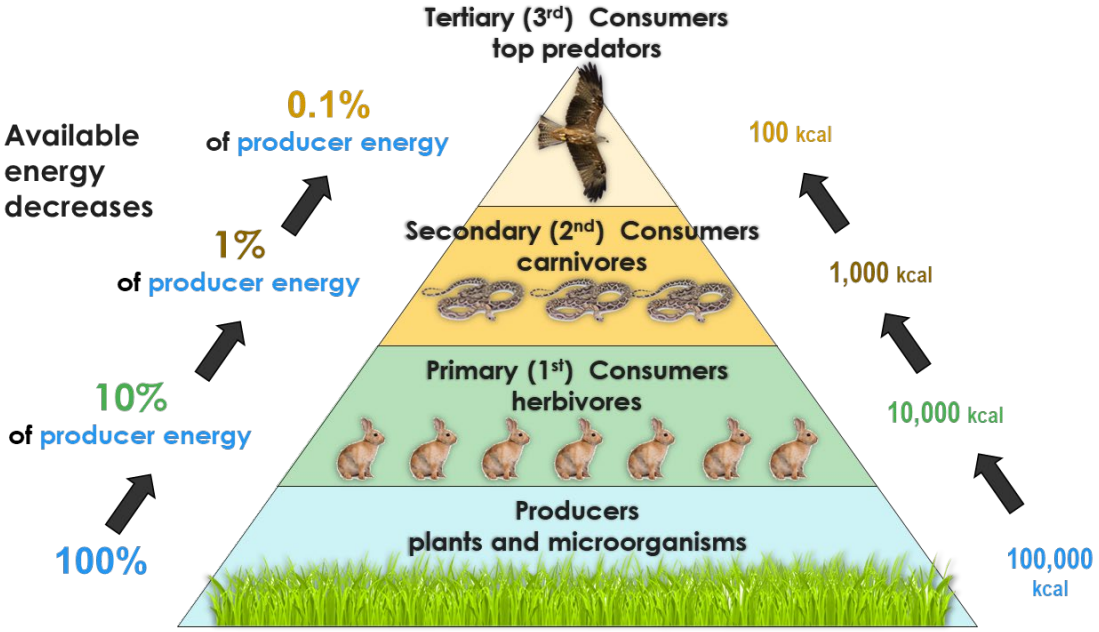
We will determine how energy flows in an energy pyramid. | Concept Development

An **energy pyramid** **represents the flow of energy** from the **producer** through various **consumers** at different trophic levels.
▶ Organisms at each **trophic level** obtain their energy from the level below, except for producers.
▶ **90%** of available energy in an organism is used for **life processes**.
▶ The remaining **10%** of energy is **stored in the organism's tissues** and can be **transferred** to the **consumer on the next trophic level**.

**Life Processes**

**making new cells, jumping maintaining body temperature**




## CFU

Which consumer obtains more energy from the producer (grass)? Explain.

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

Which consumer obtains more energy from the primary consumer (rabbit)? Explain.

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

If grass contains 100,000 kcal, how many kcal would a zebra (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?

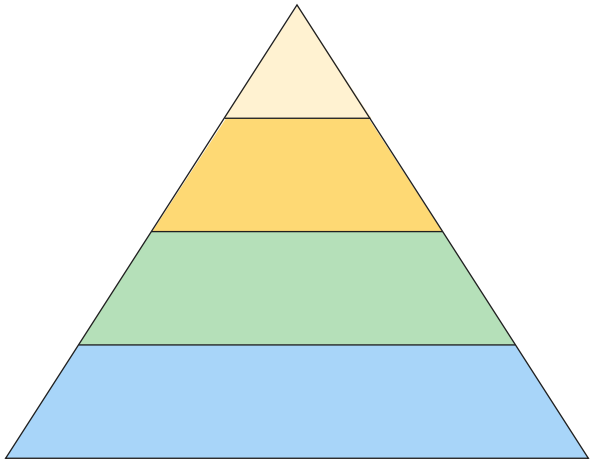
**We will determine how energy flows in an energy pyramid.** | **Skill Development/ Guided Practice**

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.** If a population of snakes consumes a population of mice that contain 3,000 kcal of available energy, how much energy is transferred to the population of snakes?

**5.** If 5,000 kcal of energy is transferred from a population of plant to a population of mice, how much energy was stored in the plants?

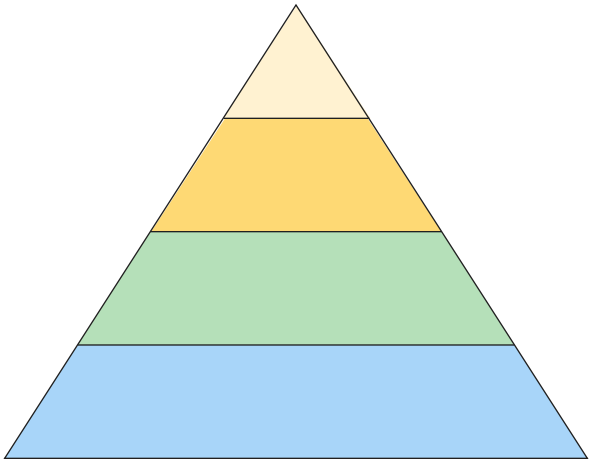
**We will determine how energy flows in an energy pyramid.** | **Skill Development/ Guided Practice**

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.**

| | | | |
|---|---|---|---|
|  fish |  algae |  raccoon |  coyote |

**2.**



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

**9.** If a population of raccoons consumes a population of fish that contain 7,000 kcal of available energy, how much energy is transferred to the population of raccoons?

**10.** If 200 kcal of energy is transferred from a population of raccoons to a population of coyotes, how much energy was stored in the raccoons?

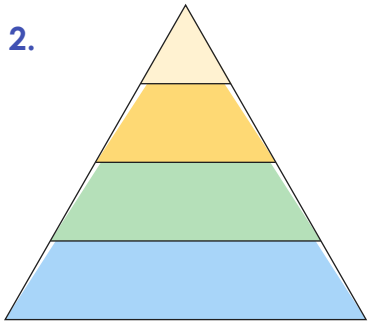
## Skill Closure

**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.** If a population of grasshoppers consumes a population of flowers that contains 300,000 kcal of available energy, how much energy is transferred to the population of grasshoppers?

**5.** If 110 kcal of energy is transferred from a population of quail to a population of 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**

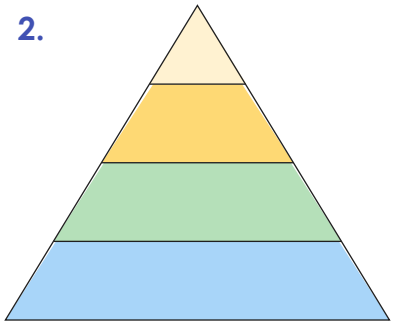
**trophic level**
**organism**
**Producer**
**Primary consumer**
**Secondary**
**Tertiary**

**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.**

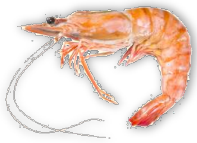


**3.** Which population contains the *least* available energy?

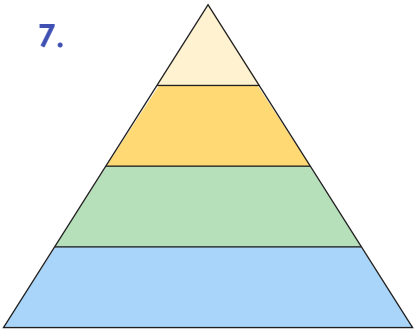
**4.** If a population of alligators consumes a population of toads that contains 400 kcal of available energy, how much energy is transferred to the population of alligators?

**5.** If 80,000 kcal of energy is transferred from a population of flowers to a population of butterflies, how much energy was stored in the flowers?

**6.**

| | | | |
|---|---|---|---|
|  |  |  |  |
| plankton | orca | shrimp | seal |

**7.**



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

**9.** If a population of seals consumes a population of shrimp that contains 12.000 kcal of available energy, how much energy is transferred to the population of seals?

**10.** If 950 kcal of energy is transferred from a population of seals to a population of orca, how much energy was stored in the seals?