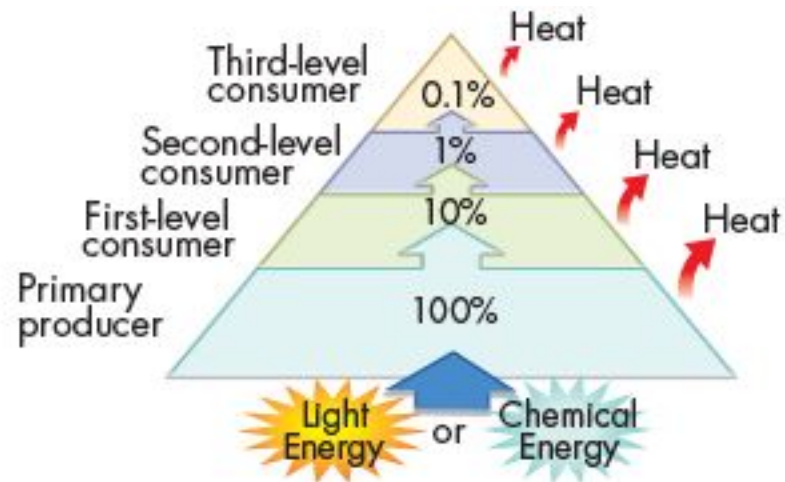


Ecological Pyramids

- Ecological pyramids show **the relative amount of energy or matter contained within each trophic level in a given food chain or food web.**
- There are three different types of ecological pyramids:
 - ✓ **Pyramid of Energy**
 - ✓ **Pyramid of Biomass**
 - ✓ **Pyramid of Numbers**

Pyramid of Energy

- Pyramid of energy **shows the relative amount of energy available at each trophic level.**
- Amount of energy **decreases** as you move up the pyramid.



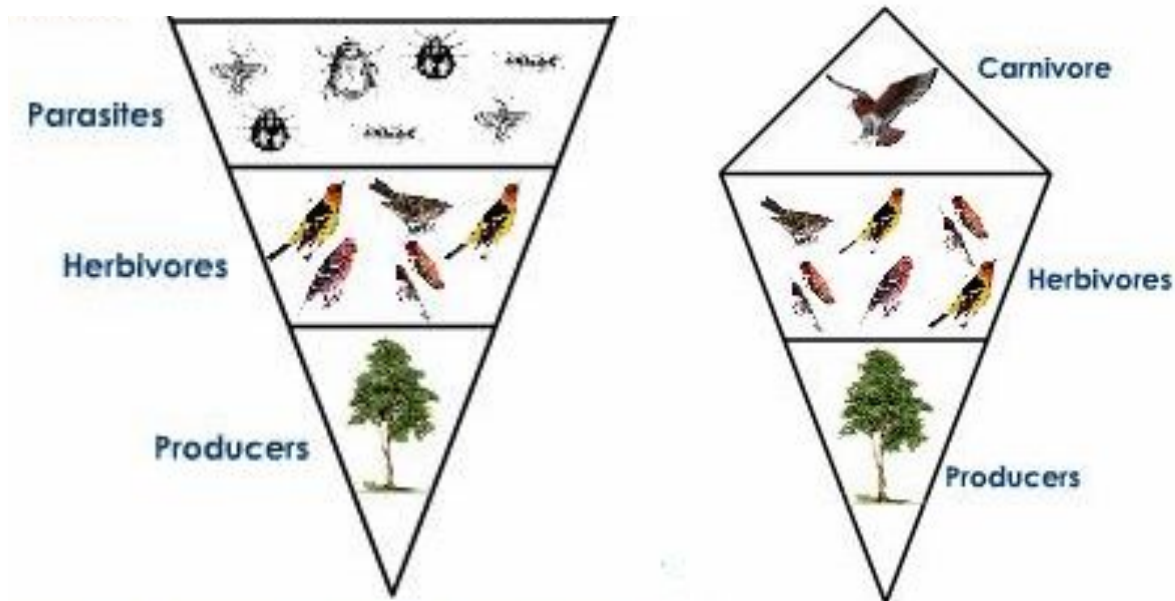
Pyramid of Biomass

- Pyramid of biomass shows the relative amount of living organic matter (biomass) available at each trophic level in an ecosystem.
- Amount of biomass **decreases** as you move up the pyramid.



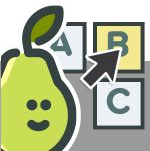
Pyramid of Numbers

- Pyramid of numbers **shows the relative numbers of organisms at different trophic levels.**
- The number of organisms may **increase** or **decrease** as you move up the pyramid.



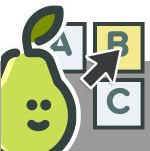
Ecological Pyramids

What type of ecological pyramid best traces the flow of matter (ex. carbon) through an ecosystem?



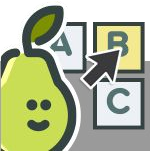
Ecological Pyramids

If you were an ecologist, which type of pyramid would provide useful information about the size of the population at each level and could tell you if a particular level is becoming too crowded?



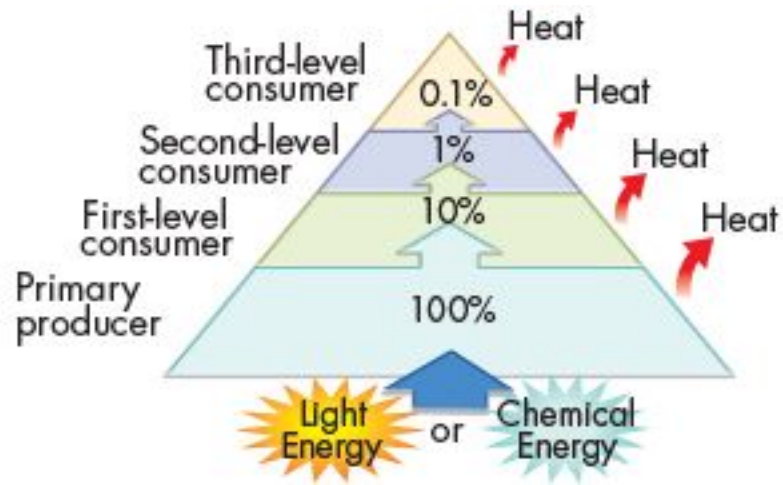
Ecological Pyramids

If you were an ecologist, which type of pyramid would you use to show if an ecosystem is in danger of collapsing?



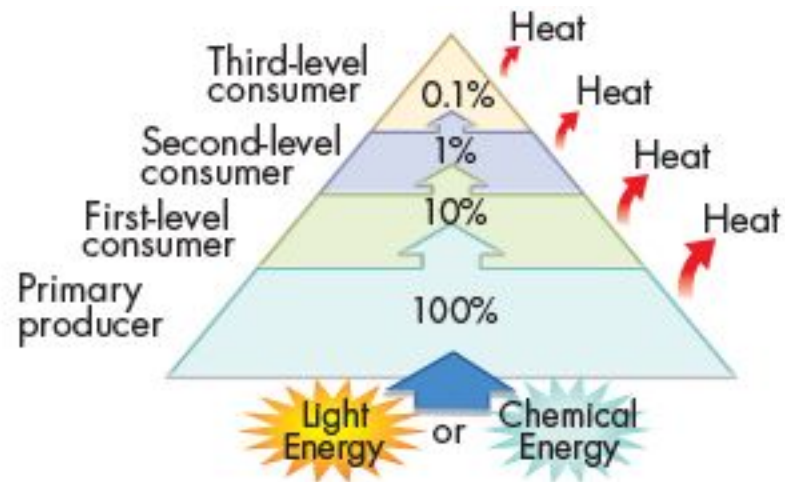
Pyramid of Energy

- There is theoretically no limit to the **number of trophic levels** in a food web or the **number of organisms** that live on each level.
- However, only a **small portion of the energy** that passes through any given trophic level is ultimately **stored** in the bodies of organisms at the next level.



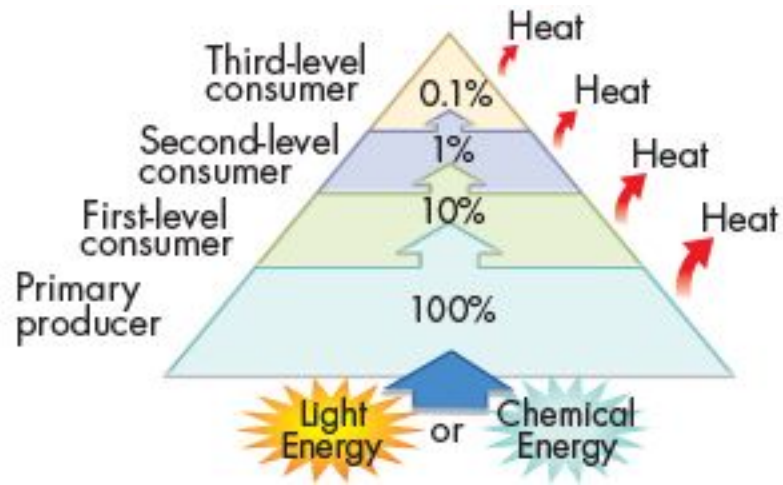
Pyramid of Energy

- Organisms expend much of the energy they acquire on **life processes**, such as cellular respiration, movement, growth, and reproduction.
- Most of the remaining energy is released into the environment as **heat** - a byproduct of these activities.



Pyramid of Energy

- On average, about **10%** of the energy available within one trophic level is transferred to the next trophic level.
- The more levels that exist between a producer and a consumer, **the smaller the percentage of the original energy from producers that is available to that consumer.**



Pyramid of Energy

If the sun is the ultimate source of energy in a ecosystem, what percentage of energy is provided by the sun to the ecosystem?



Students, write your response!

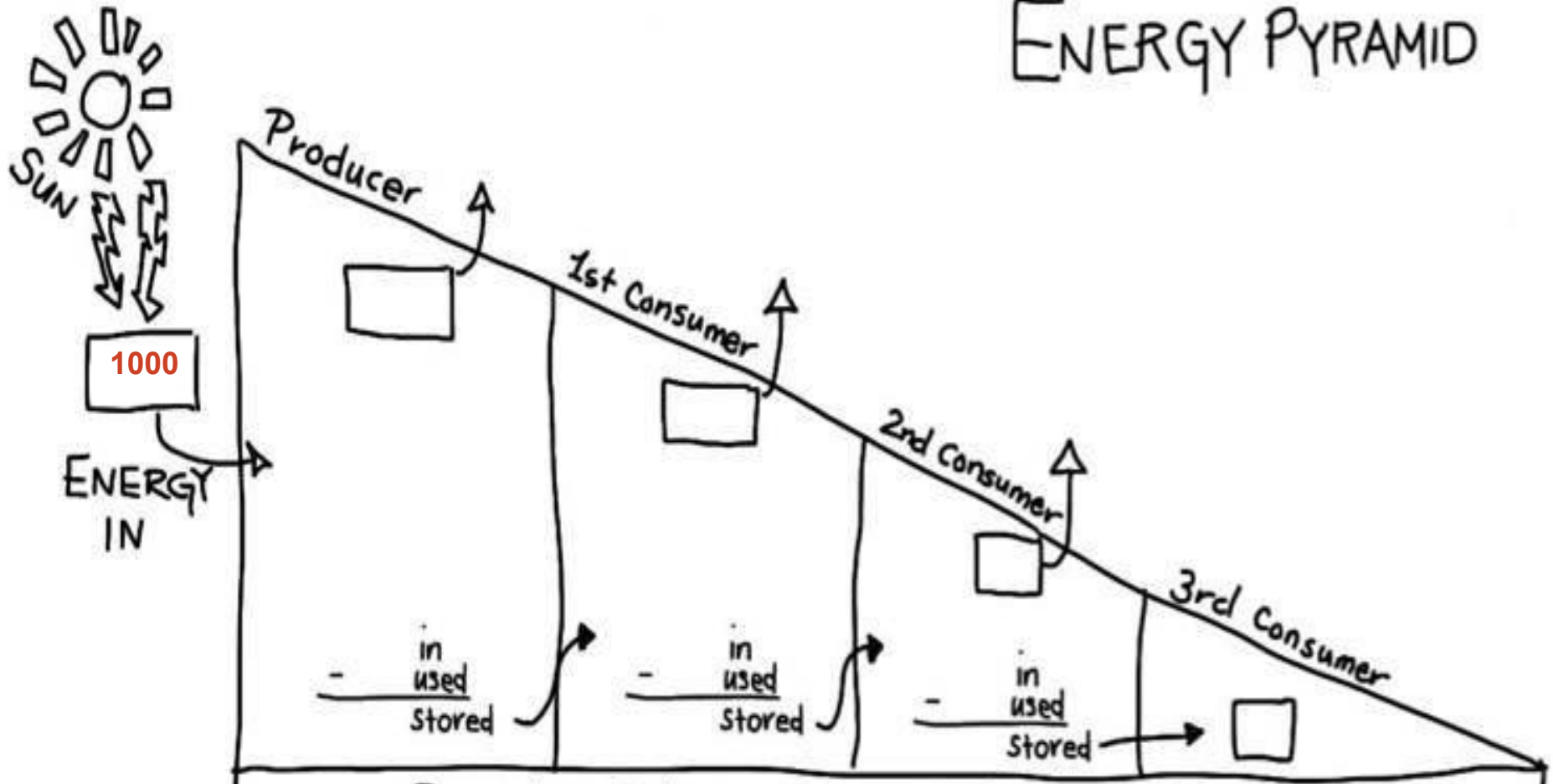
Pyramid of Energy Example

The sun provides the energy for producers to conduct photosynthesis or chemosynthesis and make food.

ENERGY IN: 1000 units



ENERGY PYRAMID



Fill in your chart with your calculations as we move along!

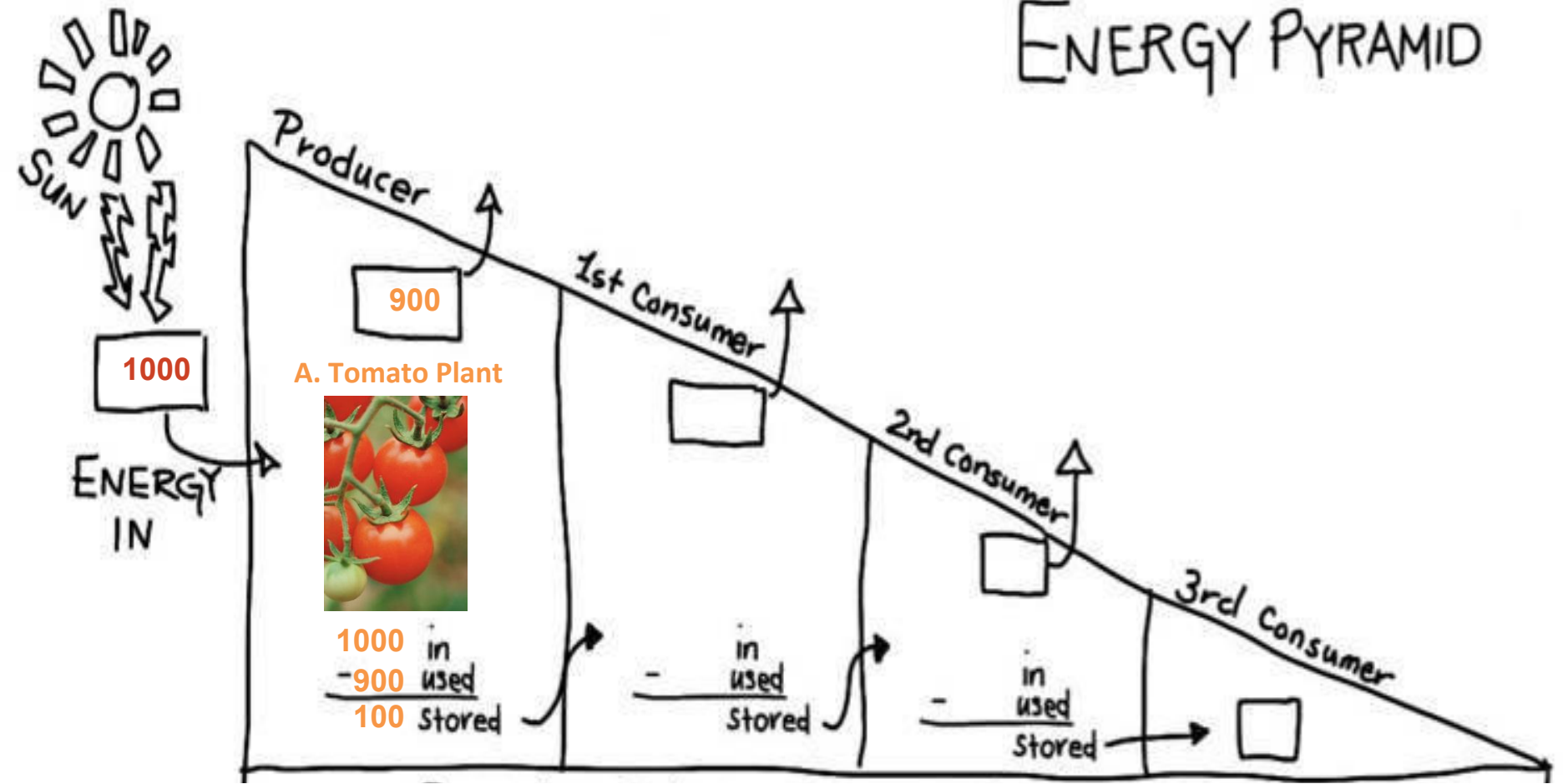
Pyramid of Energy Example

A tomato plant gets the 1000 units IN. It uses 900 of those 1000 units to power its daily activities. Much of that energy is released to power life processes or as heat. How much of the original energy is STORED?



Students, write your response!

ENERGY PYRAMID



Fill in your chart with your calculations as you see here!

Pyramid of Energy Example

The tomato hornworm loves tomatoes. When it eats the tomato, it only receives the energy stored – 100 UNITS. Of the 100 units of ENERGY IN, 90 units are used to power the worm's daily activities and much of that energy is released to power life processes or as heat.

How much of the original energy is STORED?

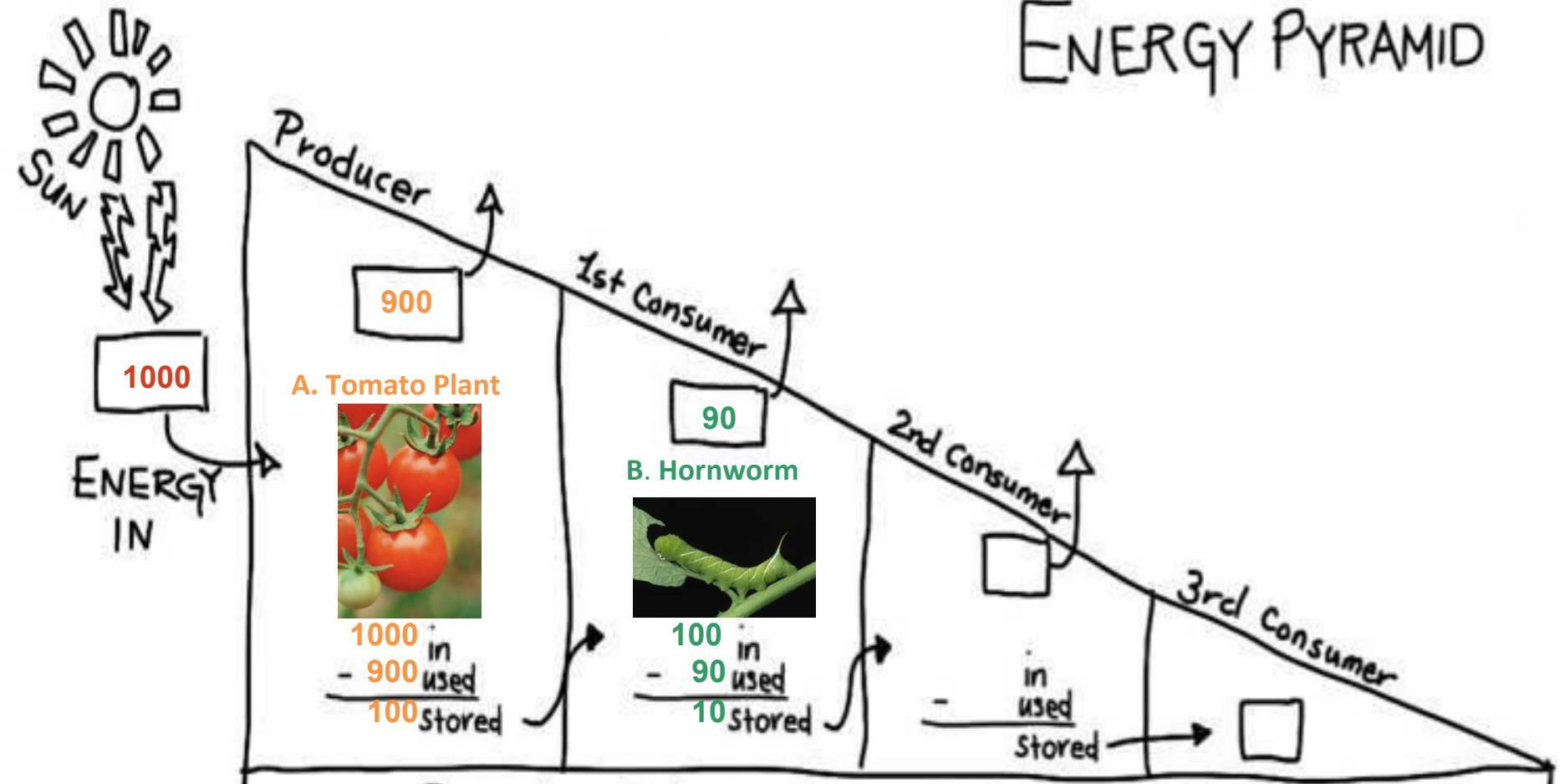


Students, write your response!

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ENERGY PYRAMID



Fill in your chart with your calculations as you see here!

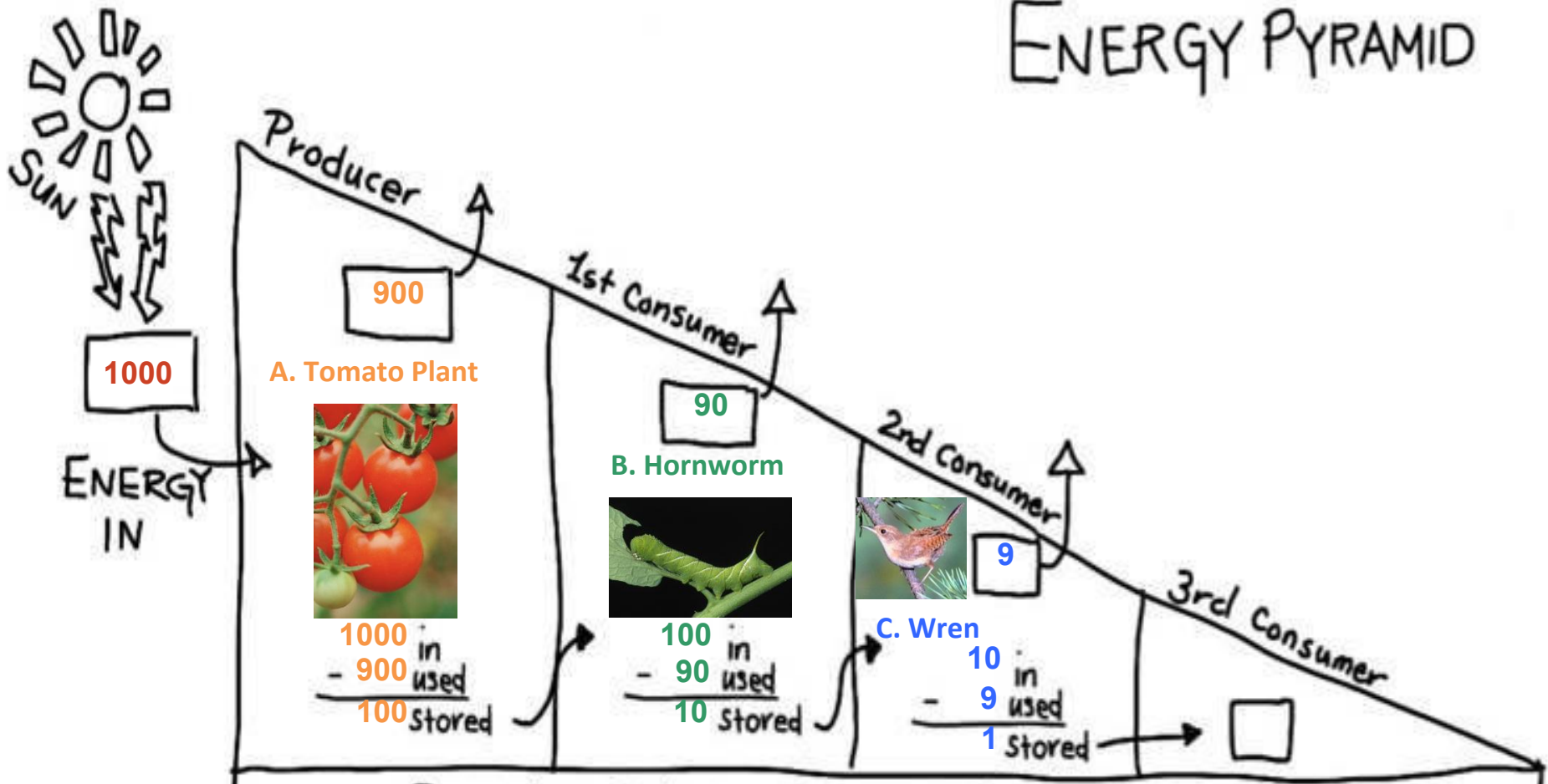
Pyramid of Energy Example

A Carolina Wren is flying up above and makes a tasty meal out of the hornworm, getting the 10 units of stored energy. Of the 10 units of ENERGY IN, 9 units are used to power the wren's daily activities and much of that energy is released to power life processes or as heat. How much of the original energy is STORED?



Students, write your response!

ENERGY PYRAMID



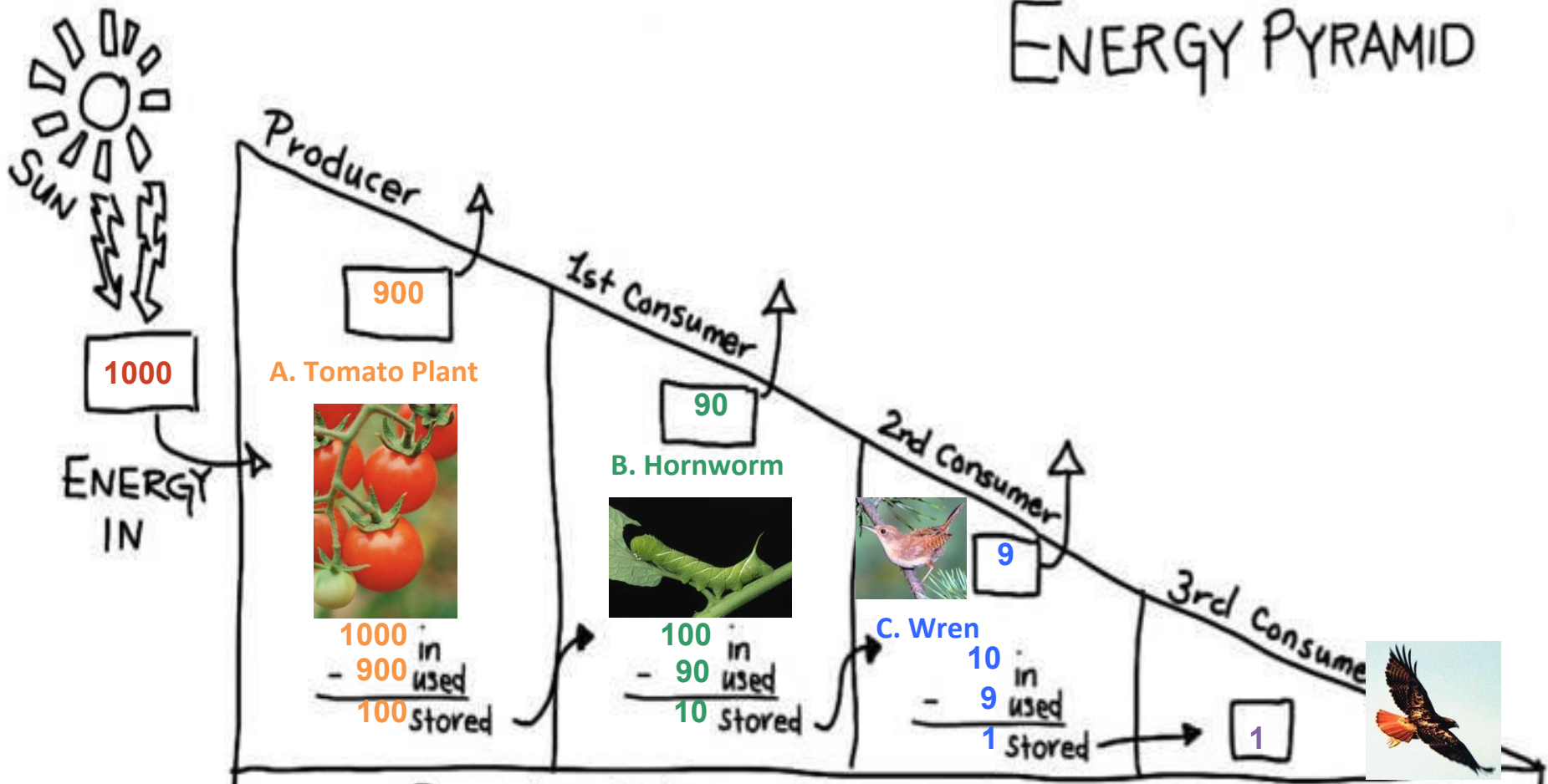
Fill in your chart with your calculations as you see here!

Pyramid of Energy Example

A **Red-tail Hawk** is circling the field and sees the wren flying below. It swoops down to catch his meal, getting the **1 unit** of stored energy as he eats it.



ENERGY PYRAMID



Your finished energy pyramid should look like this with pictures drawn and calculations complete!

Pyramid of Energy Example

Organisms release waste and die. Decomposers take over and return nutrients to the earth.



If a third level consumer died, how much energy would be left for the decomposers?



Students, write your response!