

23.1 Interdependence of Living Things



Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction



Summarize your understanding of each paragraph.

Energy flow, refers to the flow of energy through a food chain. Plants produce their own food using sunlight matter from soil. Herbivores eat plants. Carnivores eat herbivores and sometimes they eat plants or other carnivores. Decomposers break this down – into soil.

In an ecosystem, ecologists try to quantify energy flow. They use math to estimate this. They calculate the relative importance of different component species and feeding relationships.

Solar energy is used by primary producers, like green plants. Primary consumers (herbivores) eat/consume and absorb most of the stored energy in the plant through digestion, and transform it into the form of energy they need

Secondary consumers, carnivores, then consume the primary consumers. Tertiary consumers, consume the secondary consumers. A final link in the food chain are decomposers which break down the organic matter of each of the earlier levels.

Read/Summarize Text



1. Read the passage.
2. Underline key expressions in each sentence.
3. Re-write each word (or expression) you underlined.
4. Summarize the passage.

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems.

Plants or algae form the lowest level of the food web. At each link upward in a food web, only a small fraction of the matter consumed at the lower level is transferred upward, to produce growth and release energy in cellular respiration at the higher level. Given this inefficiency, there are generally fewer organisms at higher levels of a food web. Some matter reacts to release energy for life functions, some matter is stored in newly made structures, and much is discarded. The chemical elements that make up the molecules of organisms pass through food webs and into and out of the atmosphere and soil, and they are combined and recombined in different ways. At each link in an ecosystem, matter and energy are conserved.

1

2

Oklahoma School Testing Program – Science, Grade 10 2016-2017. (pg 74)

Re-write words you underlined

3

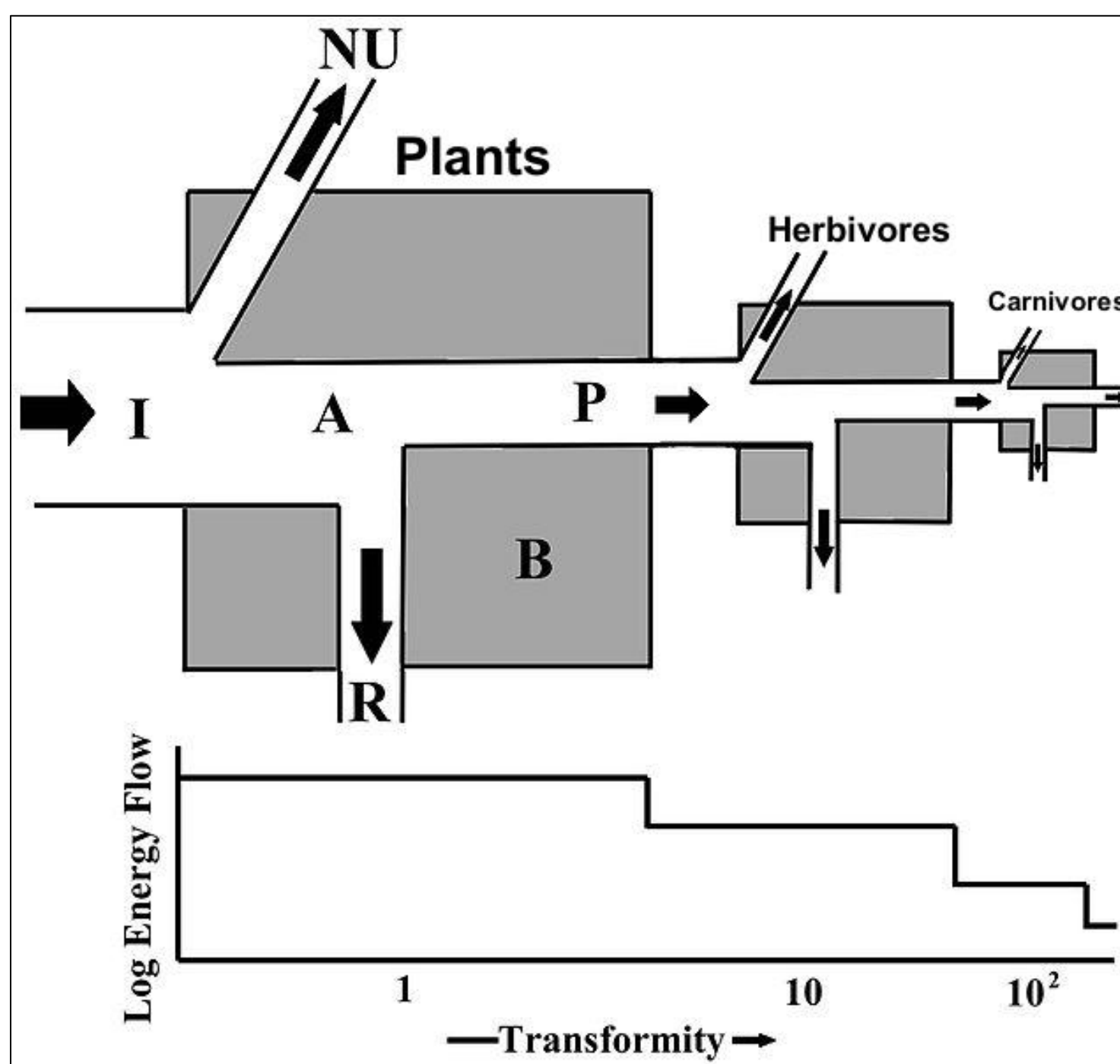
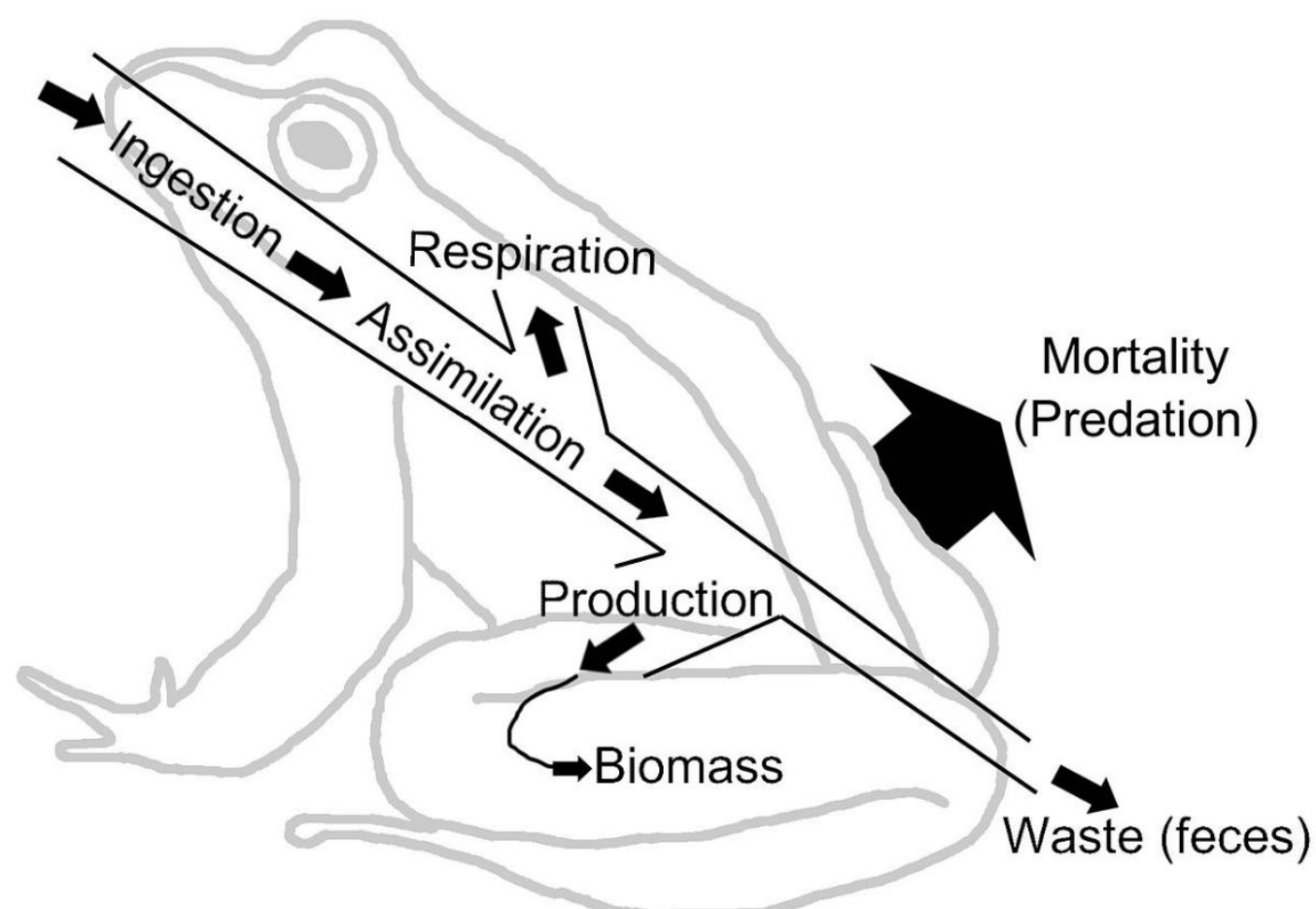
Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

The energy is passed on from trophic level to trophic level and each time about 90% of the energy is lost, with some being lost as heat into the environment (an effect of respiration) and some being lost as incompletely digested food (egesta). Therefore, primary consumers get about 10% of the energy produced by autotrophs, while secondary consumers get 1% and tertiary consumers get 0.1%. This means the top consumer of a food chain receives the least energy, as a lot of the food chain's energy has been lost between trophic levels. This loss of energy at each level limits typical food chains to only four to six links.

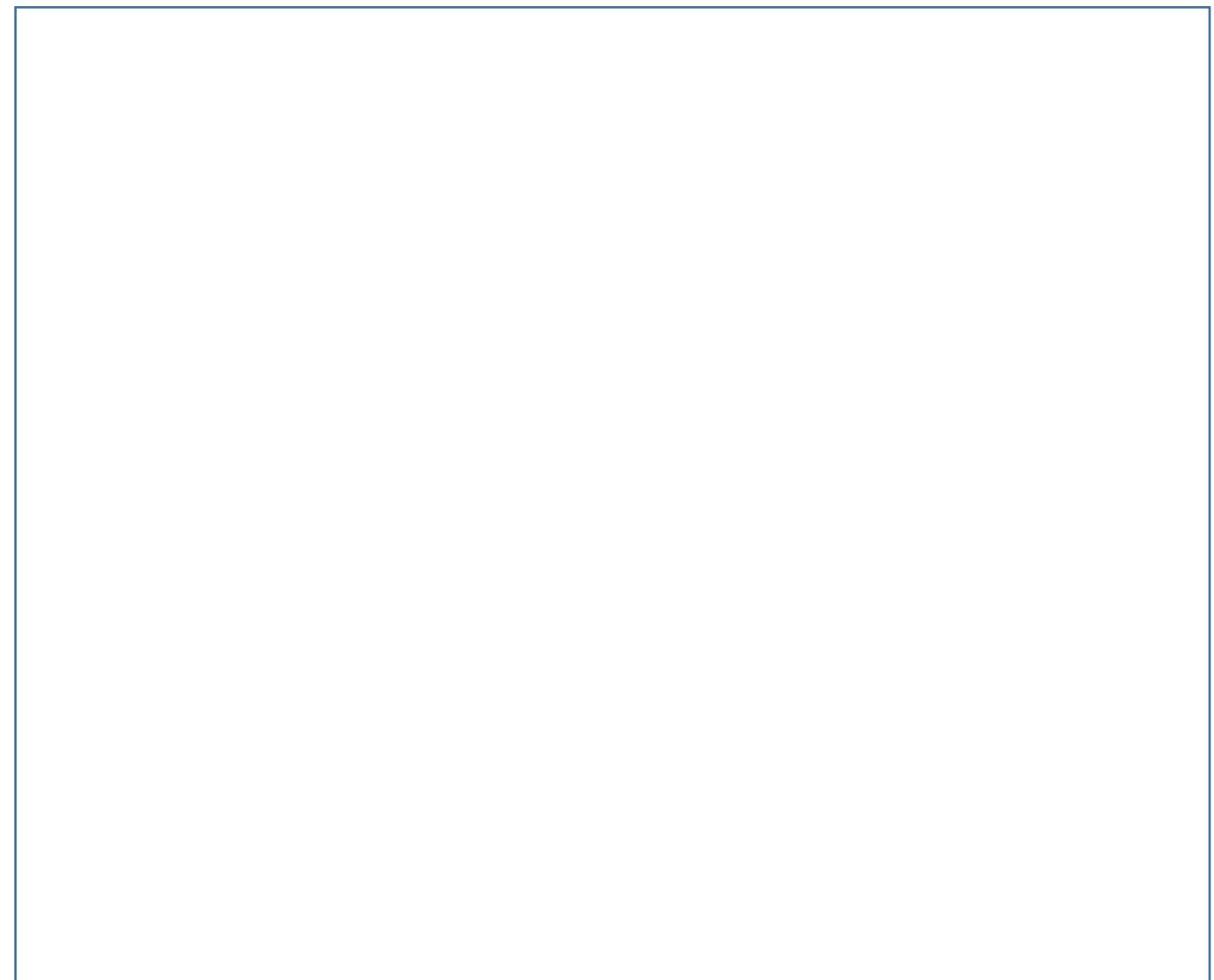
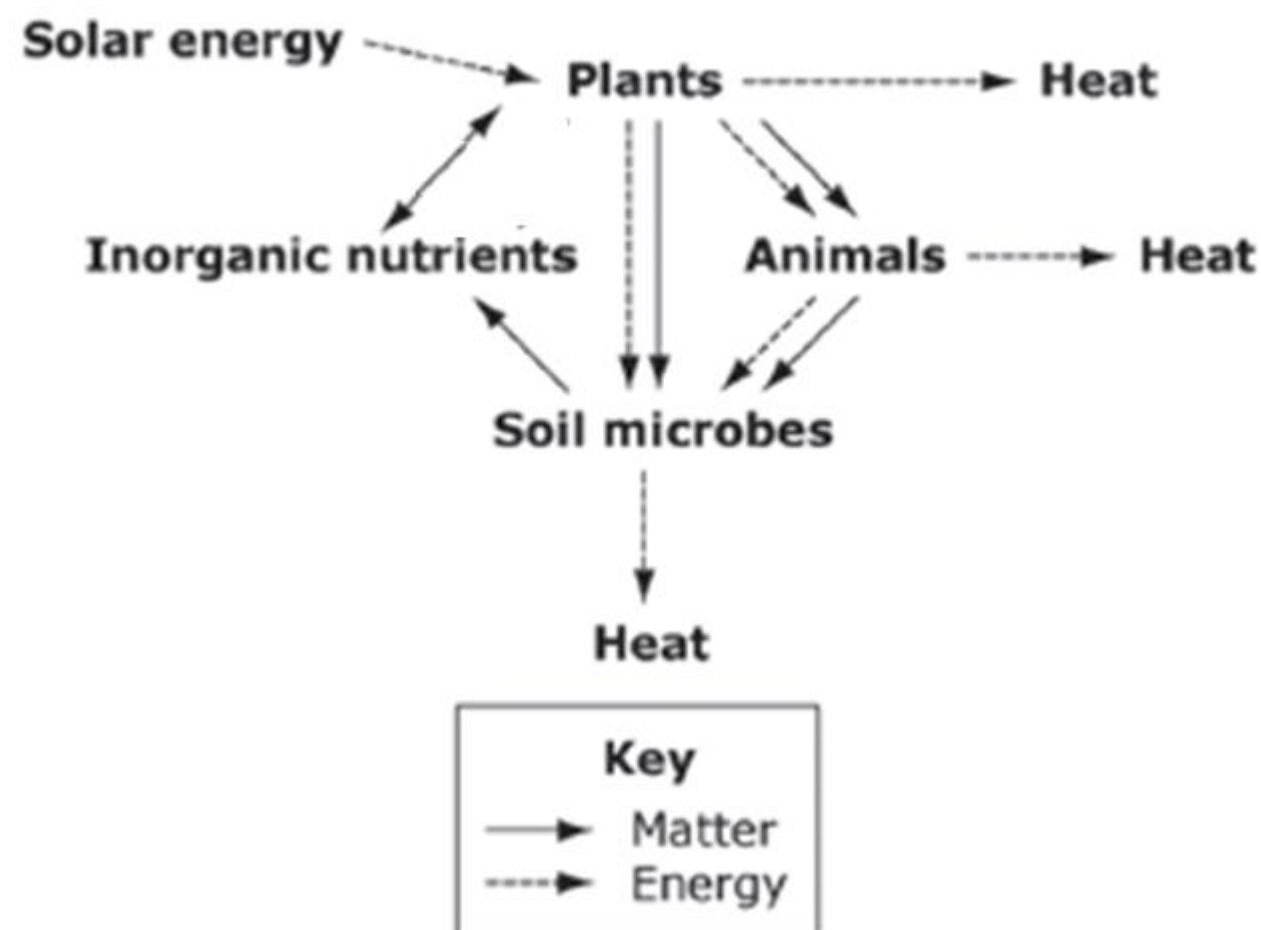


Draw Illustration

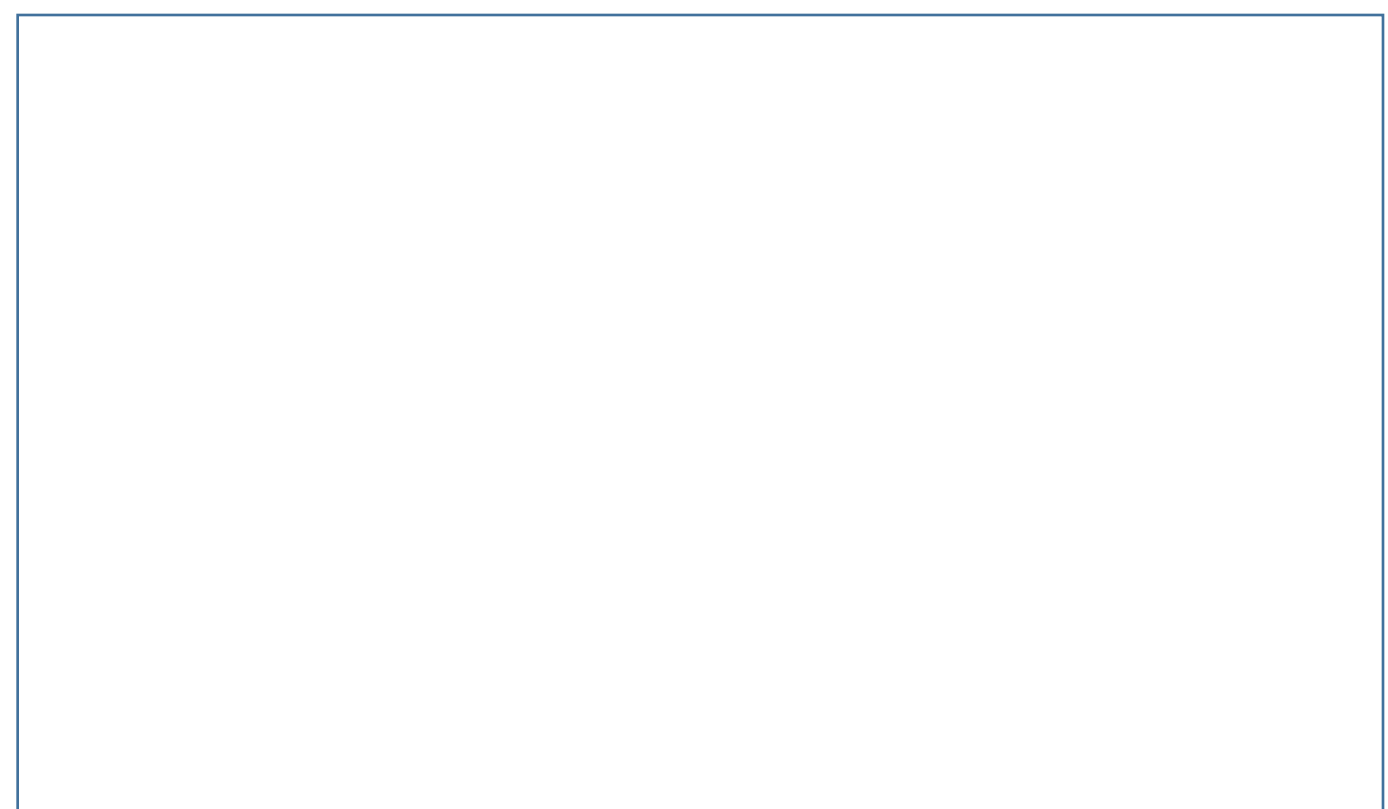


Copy and Label the Illustrations in the Space Provided

Matter and Energy Flow in a Grassland Ecosystem



Pyramid of Biomass (g/m²)



**Copy the Illustrations –
Answer These Questions.**

Based on the diagrams, which mathematical expression correctly compares the amounts of energy in different parts of the ecosystem?

- A producer energy > herbivore energy
- B carnivore energy > herbivore energy
- C carnivore energy = herbivore energy
- D producer energy = herbivore energy

Based on the diagrams, what is another mathematical expression that correctly compares the amounts of energy in parts of the ecosystem?

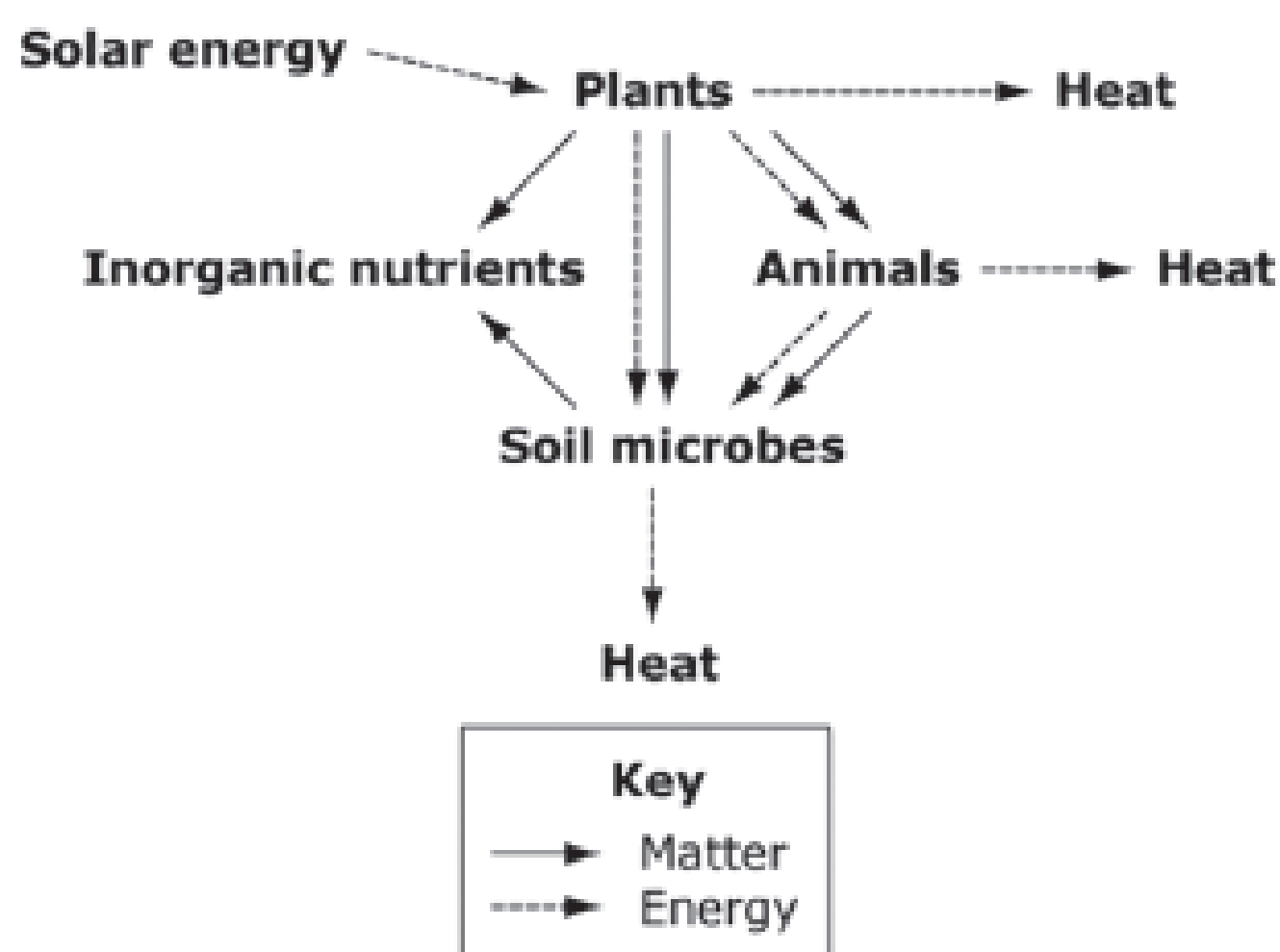
- A microbe energy = carnivore energy
- B herbivore energy > microbe energy
- C microbe energy > carnivore energy
- D herbivore energy = microbe energy

Use Your Math Skills



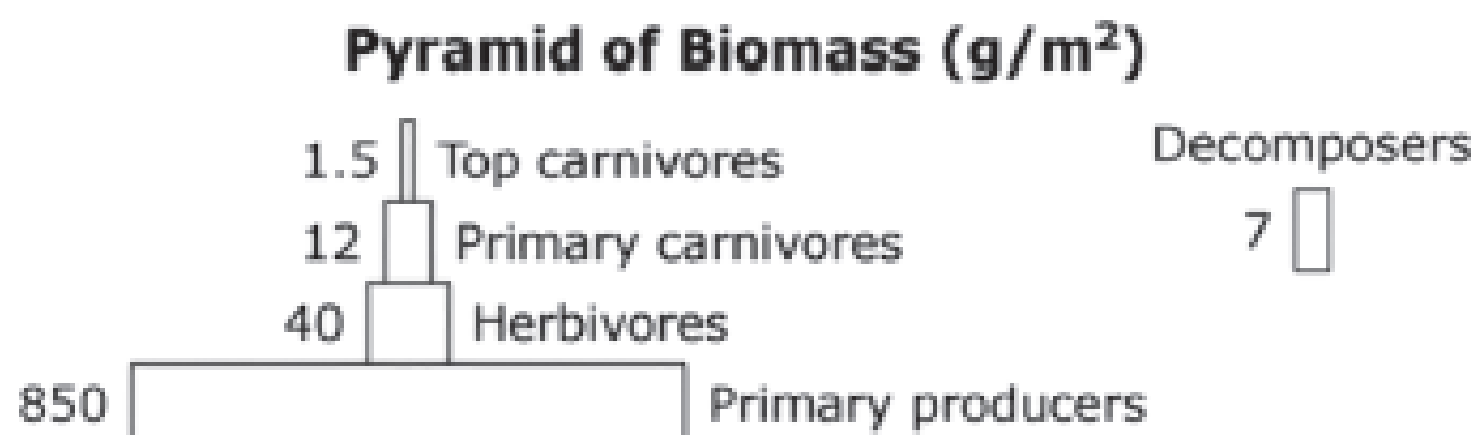
A group of students studied a grassland ecosystem. The students learned that biomass is a measure of the amount of matter in an ecosystem. They also learned that energy is primarily transferred through an ecosystem in the form of food. The students created a diagram to show what they learned.

Matter and Energy Flow in a Grassland Ecosystem



After the students created the diagram, their teacher asked them to answer this question: *How is biomass related to energy flow in the grassland ecosystem?*

To help them answer the question, the students found biomass data. They created this second diagram to illustrate the data.



Complete the mathematical expression to compare the amounts of energy in different levels of the ecosystem. Drag and drop the labels into the boxes to create the mathematical expression for the amounts of energy at the different levels. To drag a label, click and hold the label, and then drag it to the desired space. You may use each label once or not at all.

sunlight energy

carnivore energy

herbivore energy

>

=

producer energy

>

>

Activity Extract

Item Type: TEI - DOK: 2

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Show-Off Your Smarts!



Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

Q4. How would a person from 100 years ago view this information?

Q5. How does this topic connect to other science topics or math?

Q6. Describe how YOU fit into the circle of life?

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.

Write down three words introduced by this topic – then draw a poster about them.

- 1.
- 2.
- 3.