

Learning Target: I can develop and use a model based on the Laws of Thermodynamics to predict energy transfers throughout an ecosystem.



How do the Laws of Thermodynamics Affect Energy transfers video notes

1. The First Law of Thermodynamics states that energy cannot be _____ or _____. It can only be _____ or _____ from one form to another.

- Light bulbs transform _____ energy into _____ energy or radiant energy.

- Plants convert the _____ energy into _____ energy stored in _____ molecules.

- How is energy transformed when you eat food? _____

2. The Second Law of Thermodynamics states that the _____ or _____ of an isolated system will always _____ until it reaches a maximum value.

3. What is lost as unusable energy and is unavailable to do work during every energy transformation? _____

- So every time an energy transfer happens, some amount of useful energy move from the useful to the _____ category in the form of _____.

4. Look at the picture of the rabbit at about 3 minutes into the video. Write at least three ways heat energy is being lost by the rabbit.

- _____
- _____
- _____

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Quick Check for Understanding: If energy cannot be created or destroyed and is transferred from one form to another, then why do they say we have energy crisis? Pause the video and answer. _____

5. The degree of _____ or _____ in a system is called _____. Every energy transfer that takes place will _____ the entropy of the universe and _____ the amount of _____ energy available to do work. In other words, any process such as _____ reaction or set of connected reactions will proceed in a direction that _____ the overall _____ of the universe because they release more and more _____ heat energy.

Answer the following questions for the diagram shown at around 4:15 in the video.

6. What happens to the amount of available energy as it moves up each trophic level? _____

7. What is happening to most of the energy as we move up each trophic level? _____

8. Why is most of the energy being lost as move up each trophic level? _____

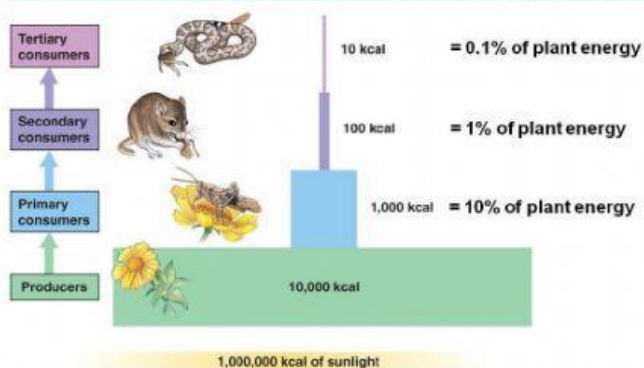
9. Each organism only receives about ____ % of energy at each trophic level, and ____ % is lost at each trophic level.

10. How is the First Law of Thermodynamics demonstrated in the diagram? _____

11. How is the Second Law of Thermodynamics demonstrated in the diagram? _____

12. The more _____ to the environment, the more _____ and/or _____ in the system and universe as a whole.

"Rule of 10" Only ~10% passes to next level.
Therefore, ~90% LOSS at each trophic level



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