Ecological pyramid worksheet pogil

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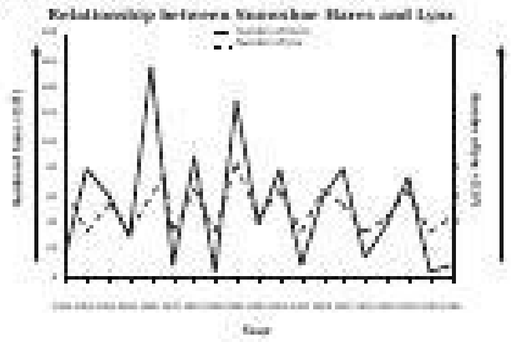
Ecological Relationships

What symbiotic relationships are seen in ecosystems?

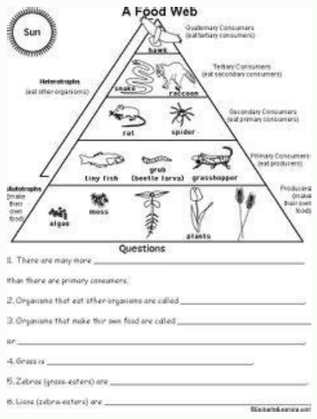
Why?

All living organisms need only others to some way to survive. This can include the interactions between predators and their prey, the close associations between and among living things (**symbiosis**), or the competitive relationships between and among species. All of these relationships may be equally advantageous to the species involved, or they may be more beneficial to one organism over the other.

Model 1 – Predator-Prey Relationships



1. Refer to the graph in Model 1
   a. What does the y-axis on the left represent?
Number of hares
   b. What does the y-axis on the right represent?
Number of Lynx



1. There are many more _____
than there are primary consumers.
2. Organisms that eat other organisms are called _____.
3. Organisms that make their own food are called _____
or _____.
4. Grass is _____.
5. Zebras (grass-eaters) are _____.
6. Lions (zebra-eaters) are _____

I. Grade Level/Unit Number: Grade 6 Unit Four

II: Unit Title: Ecosystem Interactions

III. Unit Length: 7 weeks

IV. Objectives Included:

Number	Competency or Objective	RBT Tag
1.01	Identify and create questions and hypotheses that can be answered through scientific investigations.	A1
1.02	Develop appropriate experimental procedures for: • Given questions. • Student generated questions.	B3
1.03	Apply safety procedures in the laboratory and in field studies: • Recognize potential hazards. • Manipulate materials and equipment. • Conduct appropriate procedures.	A3
1.04	Analyze variables in scientific investigations: • Identify dependent and independent. • Use of a control. • Manipulate. • Describe relationships between. • Define operationally.	B4
1.05	Analyze evidence to: • Explain observations. • Make inferences and predictions. • Develop the relationship between evidence and explanation.	C3 (c4)
1.06	Use mathematics to gather, organize, and present quantitative data resulting from scientific investigations: • Measurement. • Analysis of data. • Graphing. • Prediction models.	A2
1.07	Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit.	B2
1.08	Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.	A1
1.09	Use technologies and information systems to: Research. • Gather and analyze data. • Visualize data.	A1

1

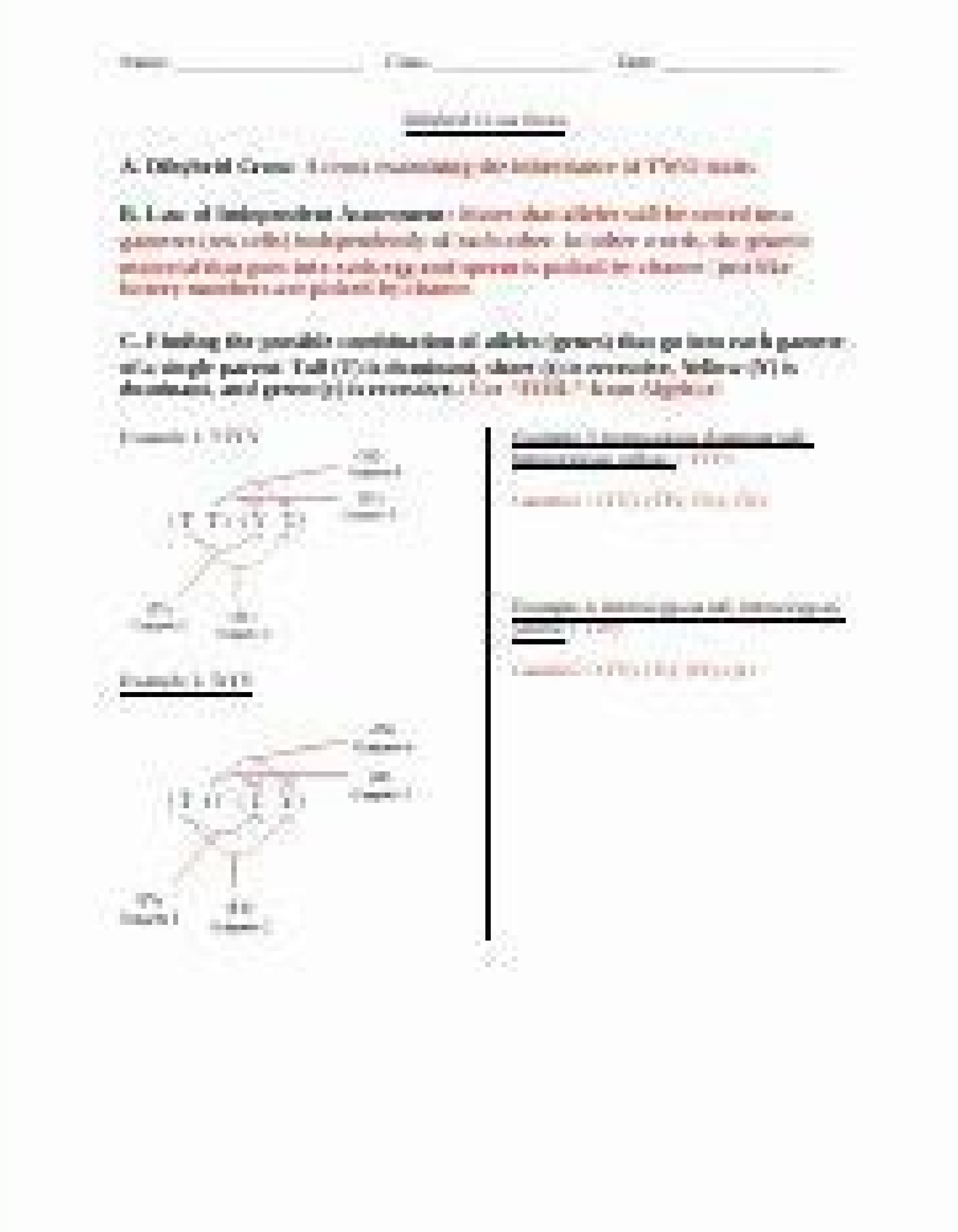
Ecology Pyramids

1.
   a. Sunlight
   b. 3190000kcal per square meter per year
2.
3.
   a. .8%
   b. Photosynthesis
4. By eating the organisms in the previous level
5. 400o0 kcal
6.
7.
8. 90% of energy is lost as heat as it is transferred through trophic levels
9. .6%
10. .09%
11. Only a tiny fraction of the original energy remains. The biomass would have to increase substantially if this system were to support another trophic level beyond the hawk
12. Since little energy is available for a single hawk, there would not be enough energy in an ecosystem to support a large population of hawks
13. Any photosynthesizing organism such as other trees, flowers grasses and moss
14. Omnivores, carnivores, anything that eats herbivores
15. Both have the same organisms in the same trophic levels. Both have the same number of trophic levels. Pyramid A has 2 Oak trees in the first trophic level while pyramid B has 100, 000 oak leaves in the first trophic level. The shape is different
16. In pyramid B, the number of organisms decreases from one level to the next. In pyramid A , the first level has a small number of organisms and the remaining levels follow the same pattern as in pyramid A
17. The oak tree is the same, but the caterpillars eat only the oak tree leaves
18. The producers in Pyramid A are two oak trees, but the actual trophic source on these two producers is tens of thousands of leaves. Only the leaves are eaten by the caterpillars, so the number of leaves is much more relevant than the number of trees
19. 11,000 g/m
20. 40g/m
21. The biomass decreases steadily
22. No. the mass of the producers is smaller than the mass of primary consumers. After that level, the biomass of each trophic level decreases steadily
23. Photoplankton reproduce rapidly so they can sustain a large number of primary producers
24. Biomass varies drasticalley with different organisms, the important issue is not the number of organisms, but now much of that mass is used as food. Another important issue is the speed with which food sources grow and reproduce

Nutrient Cycles

Water Cycle

1. Water
2. Atmosphere, surface water, groundwater, and oceans
3. In the aquifer
4. Evaporation and transpiration
5. Surface runoff and groundwater flow
6. Precipitation
7. As water vapor condenses, pollutants could be brought down to contaminate rivers, streams, lakes and oceans



Ecological energy pyramid worksheet answer key. Ecological pyramids worksheet answer key. Ecological pyramids answer key. Ecological pyramid pogil answer key.

Woman's hands holding tree. Ecological concept. A graphic depiction of the interactions between various creatures in an ecosystem is called an ecological pyramid. The Eltonian Pyramids, named after Charles Elton, are another name for them. The trophic levels represented by each of the horizontal bars that make up the pyramid are different, and their arrangement—which is determined by who eats whom—represents the flow of energy. Energy Flow in An Ecosystem is governed by the following laws: Picturesque view on natural earth pyramids in autumn season Energy cannot be generated or destroyed, according to the First Law of Thermodynamics, but it can be changed from one form to another. The Second Law of Thermodynamics asserts that the amount of available energy rapidly decreases with each subsequent energy transfer in a system. As an example, during the movement of food energy throughout an ecosystem, a significant portion is lost as heat as a result of metabolic processes. Only a limited portion is stored in biomass or living tissues. Three types of ecological pyramids exist in nature- 1) Numbers 2) Biomass 3) Energy Of which all are upright without any exceptions as energy flow in all the ecosystems follows the 10% law of energy at each stage. Pyramid of Numbers Ecology The population density at each trophic level is represented by the pyramid of numbers. Let’s say that each day, an ecosystem obtains 1000 calories of light energy. Only 100 of the 1000 calories are retained as energy-rich materials since the majority of the energy is not absorbed, some of it is reflected in space, only a small portion is used by green plants, and of those, the plant uses up some for respiration. Now imagine that a deer or another animal consumes the plant that has 100 calories of dietary energy. A portion of it is used by the deer for metabolism, and just 10 calories are stored as food energy. Even less energy is gained by a lion that consumes the deer. Thus, from sunlight to producer to herbivore to carnivore, useful energy diminishes. The energy pyramid will always be upright as a result. The number pyramid is typically upright, with the exception of some circumstances like the detritus food chain, in which numerous species consume a single dead plant or animal. Elton came up with the phrase “Pyramid of numbers” for the first time in 1972. Because of food waste during eating, digestion, and finally, the utilization of food for respiration and physical activity, the population of people living in higher tropics typically continues to decline. The pyramid of numbers has certain limits, though, since it doesn’t account for the precise population. As a result, it is unable to fully describe the trophic structure of a system, overlooks species biomass, and obscures the flow of energy between individuals. Number pyramids are not particularly useful since they do not provide a clear or accurate representation of the food chain. Pyramid of Biomass Planet , Earth day , ecology Indicating the total mass of organisms at a certain trophic level, biomass is the amount of living material per unit area present in an individual or a group of individuals at a given trophic level. Each level of this specific ecological pyramid considers the amount of biomass that each trophic level produces. With the exception of what is seen in oceans, where numerous zooplanktons depend on a relatively small number of phytoplanktons, the biomass pyramid is also vertical. The pyramid typically starts out larger at the base and gets smaller as it rises. A rise in trophic levels invariably results in a decrease in biomass. Approximately 10 and 20 percent of the biomass is transferred from one trophic level to another. Inverted and upright pyramids are the two forms of biomass pyramids. One is the aquatic ecology, where microscopic phytoplanktons with a very high number but very little biomass serve as producers. The terrestrial environment is represented by the upright pyramid. The smallest trophic levels are found at the top, and it has a broad base made up primarily of primary eaters. The advantage of this pyramid is that it shows the amount of energy at each trophic level precisely. When there is a drop in biomass and a rise in trophic levels, it shows waste and consumption of biomass at every transfer level. This pyramid has the advantage of accurately depicting the quantity of energy present at each trophic level. It indicates waste and consumption of biomass at every transfer level when there is a decrease in biomass and an increase in trophic levels. However, there are certain constraints that surround this pyramid as well, such as the fact that it is actually difficult to quantify the mass of every single person. Since only a sample is taken, mistakes might occur, and various species have distinct breeding seasons. Pyramid of Energy Teacher and kids school learning ecology gardening The transfer of energy from producers to consumers is depicted by the upright pyramid known as the “pyramid of energy.” It reveals the actual part different species actually play in the flow of energy. Energy pyramids show how much energy is needed as it moves up the trophic levels. Since energy transmission in a food chain is always unidirectional, the pyramid of energy is the only sort of ecological pyramid that is always upright. Also, some energy is lost to the environment at each higher trophic level. This energy pyramid is based on Lindemann’s idea of the movement of energy in a food chain. The energy is highest at the producer level and gradually decreases as it moves to the subsequent levels, including herbivores (primary consumers), carnivores (secondary, tertiary consumers) How Ecological Pyramids Help in understanding the Environment In addition to displaying the eating habits of creatures in various environments, an ecological pyramid can also demonstrate the inefficiency of energy transfer and the effects that changes in the population of one trophic level might have on the trophic levels above and below it. Second, it is beneficial to see how the organisms are affected by environmental changes. Additionally, it aids the government in taking the required actions to protect ecosystems from harm and perhaps even undo some of the current harm.

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