**Ecology Questions-Study Guide** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ # \_\_\_\_\_\_\_

\*You may have to RESEARCH some of these questions!

1. List the 5 levels of ecological study and give examples of the focus of inquiry at each level:
2. Give an example of a purposefully introduced species and an accidentally introduced species that have become pests in North America
3. Mountains affect local climate.  Describe their influence in the following three areas:

a. solar radiation:

b. temperature:

c. rainfall:

Indicate with a + or – whether the following are relatively high or low in oxygen level, nutrient content and productivity.

|  |  |  |  |
| --- | --- | --- | --- |
| Biome | Oxygen level | Nutrient content | Productivity |
| Oligotrophic lake |  |  |  |
| Eutrophic lake |  |  |  |
| Headwater of stream |  |  |  |
| Turbid river |  |  |  |
| Estuary |  |  |  |

1. Define ecology:
2. What are biomes? Give 6 examples and defining characteristics
3. What accounts for the similarities in life forms found in the same type of biome in geographically separated areas?
4. Identify the types of survivorship curves shown below and give examples of groups that exhibit each curve.



1. Mortality, number of offspring per reproduction, and prenatal investment are usually interrelated.  On the following graphs, sketch the relationship you would predict between the variables.



1. Label the exponential (a) and logistic (b) growth curves, and show the equation associated with each curve.  What is ***K*** for the population show with curve ***b***?



1. List some density-dependent factors that may limit population growth
2. List some abiotic factors that may cause population fluctuations.
3. Species composition and distribution in most plant communities appear to be individualistic.  What may explain the occasional occurrence of sharp delineations in species composition between communities?
4. Name the following 2 types of mimicry:
	1. Harmless species resembling a poisonous or distasteful species:
	2. Mutual imitation by two or more distasteful species:
5. Name and give examples of the interspecific interactions symbolized in the table:

|  |  |  |
| --- | --- | --- |
|   | Interactions    | Examples  |
| +/+ |  |  |
| +/0 |  |  |
| +/- |  |  |
| -/- |  |  |

1. Explain the importance of keystone species.
2. Many freshwater lake communities appear to be organized along the top-down model.  What actions might ecologists take if they wanted to use *biomanipulation* to control excessive algae blooms in a lake with four trophic levels (algae, zooplankton, primary predator fish, and top predator fish)?
3. Compare & contrast primary vs. secondary succession.
4. List some ecosystems with high rates of production.
5. List some ecosystems with low rates of production.
6. The open ocean has low net primary production yet contributes the greatest percentage of earth’s net primary production.  Explain.
7. Antarctic seas are often more productive than most tropical seas, even though they are colder and receive lower light intensity.  Explain.
8. Why is production efficiency higher for fishes than for birds and mammals?
9. Assuming a 10% trophic efficiency (transfer of energy to the next tropic level), approximately what proportion of the chemical energy produced in photosynthesis makes it to a tertiary consumer?
10. In which natural ecosystem do nutrients cycle the fastest?  Why?
11. In which natural ecosystem to nutrients cycle the slowest?  Why?
12. What is the effect of loss of vegetation on nutrient cycling?
13. List some of the potential consequences of global warming:
14. Explain biomagnification and the consequences to organisms in highest trophic level.
15. Two processes that emerge at the ecosystem level of organization are energy flow and chemical cycling.  Develop a **concept map** that explains, compares, and contrasts these 2 processes.

1. Describe four or five human intrusions in ecosystem dynamics that have detrimental effects.
2. Give an example of how each of the following causes of the biodiversity crisis has reduced population numbers or caused extinctions.

a.       habitat destruction:

b.      introduced (non- native) species:

c.       overexploitation

d.      disruption of food chains:

1. What are the major threats to biodiversity, listed in order of importance?
2. How does the loss of biodiversity threaten human welfare?
3. Explain why an endangered species is always on the verge of extinction.
4. Go over: Population Problems
5. Go over: Simpson Diversity Index