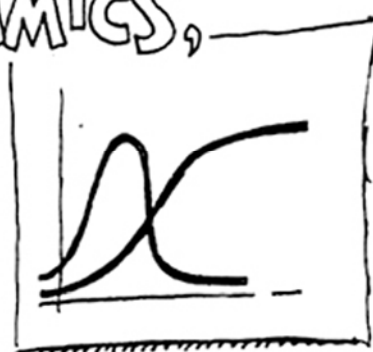


THE STUDY OF HOW POPULATIONS
RISE AND FALL IS CALLED

POPULATION DYNAMICS,

AN INEXACT SCIENCE WITH LOTS OF GRAPHS.



FOR NOW, LET'S JUST SKIM
OVER A FEW KEY CONCEPTS.

BIOTIC POTENTIAL

IS THE MAXIMUM GROWTH RATE OF A POPULATION, OFTEN WRITTEN r_{max} . IT DEPENDS ON THE NUMBER OF OFFSPRING, THEIR AVERAGE SURVIVAL RATE, AND HOW EARLY AND OFTEN REPRODUCTION TAKES PLACE. r_{max} IS HARD TO MEASURE OUTSIDE THE LAB.



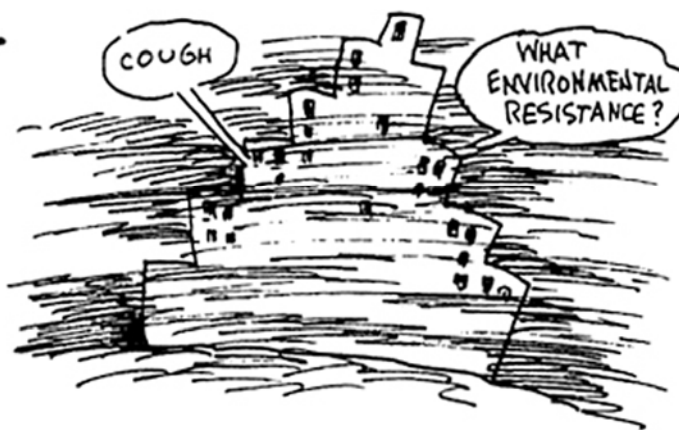
REPRODUCTIVE STRATEGIES

ARE SUPPOSED TO ENSURE THAT BIRTHS EXCEED DEATHS, SO THAT THE POPULATION WILL INCREASE UNLESS CHECKED IN SOME WAY.



ENVIRONMENTAL RESISTANCE

INCLUDES FACTORS THAT LIMIT POPULATION. THESE *LIMITING FACTORS* DETERMINE THE *CARRYING CAPACITY*, OR THE NUMBER OF INDIVIDUALS IN A POPULATION THAT CAN BE SUSTAINED INDEFINITELY IN A GIVEN ECOSYSTEM. THIS IS ANOTHER HARD NUMBER TO SPECIFY.



This diagram came from the *Cartoon Guide to the Environment*. I included it to show the style of the book and because it does provide some useful information on populations.

Part 1

For questions 1-12 write in the world that answers the question.

- ✓ 1. What important ingredient for life doesn't cycle the way water, nitrogen, and carbon - oxygen do?
2. Bacteria, mold, fungi are examples of _____
3. Moist soil would be considered an earthworm's _____
4. An animal that eats only plants is called a(n) _____
5. A pond, with all the plants and animals living there, plus the water, nutrients and minerals, and sunlight is an example of a(n) _____
6. The animals and plants in a pond are an example of a(n) _____
7. Ecosystems receive their energy from _____
8. Algae and green plants use water, solar energy, and _____ to make their food.
9. All of the following are abiotic parts of an ecosystem except
A) water B) plants C) sunlight D) temperature
10. Water is changed from a liquid to a gas in the process of _____
11. What abiotic (not from living organisms) material plays an important role in all three of the cycles?
12. What living material is essential to the smooth operation of all three of the cycles?
13. In a marsh or woodland ecosystem would you expect to find more insects or more hawks? Briefly explain why.
14. How do plants obtain the nitrogen they need to make protein?
15. How do animals receive the nitrogen they need to make protoplasm ("stuff of life")

Answers to above

1. energy 2. decomposers (not all bacteria decompose but the nitrogen fixers still turn chemicals into forms usable by other living things. 3. habitat 4. herbivore 5. ecosystem 6. community 7. sun (in most cases -- see information on deep sea vents) 8. carbon dioxide 9. B 10. transpiration is the relevant idea for ecology but evaporation could be important if discussing rainfall. 11. atmosphere or air, 12. Probably meant plants 13. more insects, more prey than predators 14. from soil 15. Eating plants or animals (amino acids).