

Name \_\_\_\_\_

Period \_\_\_\_\_

AP Biology

Date \_\_\_\_\_

**RAVEN CHAPTER 53 GUIDED NOTES: POPULATION ECOLOGY**

1. Define ecology. \_\_\_\_\_  
\_\_\_\_\_

2. List the four key variables that characterize the environment in which an organism lives.

a. \_\_\_\_\_ c. \_\_\_\_\_

b. \_\_\_\_\_ d. \_\_\_\_\_

3. In coping with environmental changes organisms have evolved two distinct approaches. Characterize each. Give an example of each.

a. endotherm (regulator) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b. ectotherm (conformer) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Define population. \_\_\_\_\_  
\_\_\_\_\_

5. List the 3 characteristics that can be used to describe a population.

a. \_\_\_\_\_ c. \_\_\_\_\_

b. \_\_\_\_\_

6. List some of the factors that determine the range of a population of organisms. (In effect, explain why polar bears are found in the Arctic but not in the tropical rainforest).

\_\_\_\_\_  
\_\_\_\_\_

7. Describe three patterns of population distribution.

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

8. Application: One species of birds is highly territorial, while a second lives in flocks. What is each species' likely pattern of dispersion? Explain.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. Define demography. \_\_\_\_\_

\_\_\_\_\_

10. Describe how each of the following factors affect population growth rates.

a. sex ratio \_\_\_\_\_

\_\_\_\_\_

b. generation time \_\_\_\_\_

\_\_\_\_\_

c. age structure \_\_\_\_\_

\_\_\_\_\_

11. What are life tables used for in population studies? \_\_\_\_\_

\_\_\_\_\_

12. Compare the survival strategies of species and give an example of each type.

Type I \_\_\_\_\_

\_\_\_\_\_

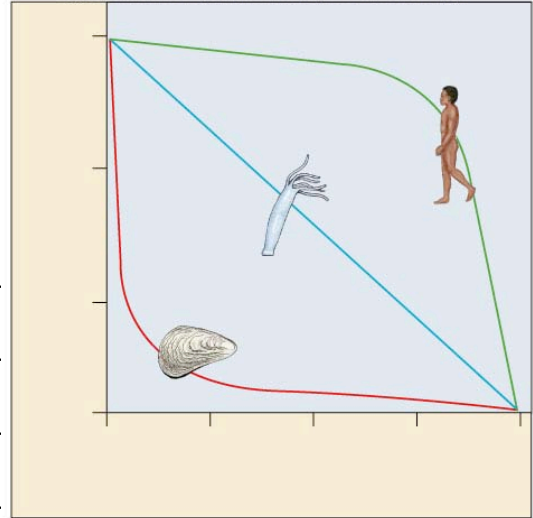
Type II \_\_\_\_\_  
\_\_\_\_\_

Type III \_\_\_\_\_  
\_\_\_\_\_

13. Label the survivorship curves diagram.

14. Life history adaptations involve many trade-offs between the cost of reproduction and the investment in survival. Explain this statement.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



15. Briefly describe the trade-offs with respect to each of these factors.

a. Investment per offspring \_\_\_\_\_  
\_\_\_\_\_

b. Reproductive Events per Lifetime \_\_\_\_\_  
\_\_\_\_\_

c. Age at First Reproduction \_\_\_\_\_  
\_\_\_\_\_

16. Application: Consider two rivers— One is spring fed and is constant in water volume and temperature year-round; the other drains a desert landscape and floods and dries out at seasonal intervals. Characterize the likely reproductive strategy of the animals in each environment (semelparity vs. iteroparity). Explain

\_\_\_\_\_  
\_\_\_\_\_

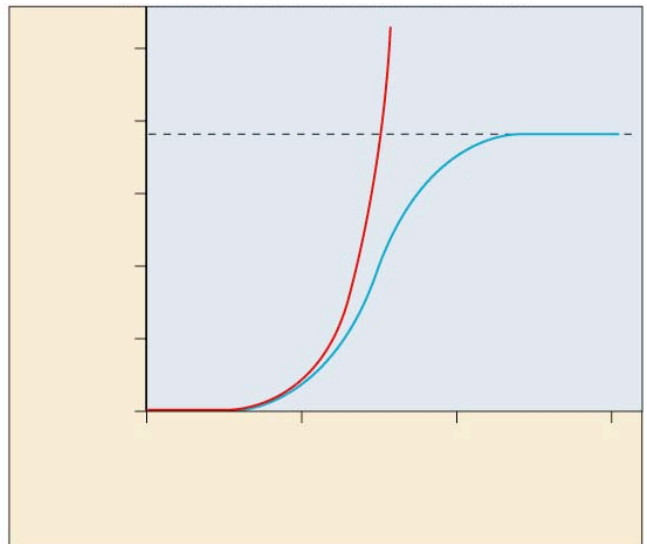
17. Define biotic potential. \_\_\_\_\_  
\_\_\_\_\_

18. Explain why the exponential growth curve produces a “J-shaped” curve instead of a straight line.  
\_\_\_\_\_  
\_\_\_\_\_

19. Explain why an exponential growth curve is rarely seen in nature. Give examples of when it is likely to occur.  
\_\_\_\_\_  
\_\_\_\_\_

20. Label the graph illustrating the two models of population growth.

21. Define carrying capacity \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



22. Write the formula for population growth without limits. Define the terms.  
\_\_\_\_\_  
\_\_\_\_\_

23. Write the formula for population growth with limits. Define the terms.  
\_\_\_\_\_  
\_\_\_\_\_

24. What happens to a population when the number of individuals approaches carrying capacity?

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25. Identify factors that regulate population size.

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26. Compare density-independent and density-dependent factors limiting populations.

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27. Compare K-selected to r-selected species. Give examples of each.

a. K-selected \_\_\_\_\_

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b. r-selected \_\_\_\_\_

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28. Look at the growth curve of the human population. How does it compare to the growth curves earlier in the chapter?

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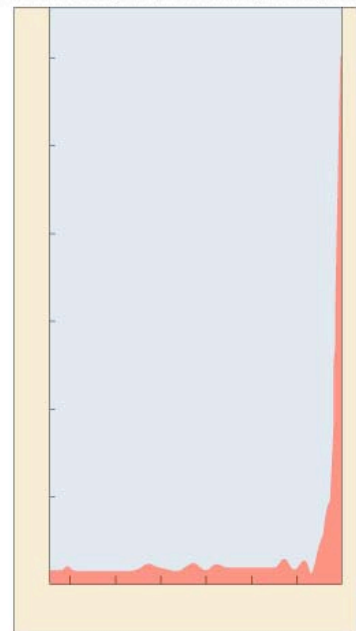
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29. Have humans reached K? What factors are significant when explaining our growth curve? Label the graph.

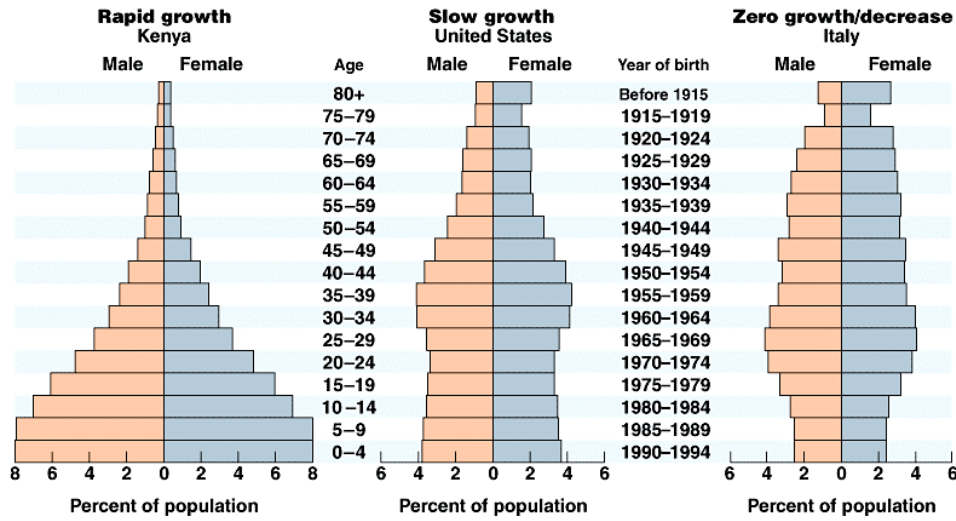
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30. Look at the age structure diagrams (population pyramids) of different countries. What will the population distributions look like in 20 years? Application: How might the age structure influence policy?




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31. Explain ecological footprint. \_\_\_\_\_

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32. Explain the significance of this diagram.  
Application: What is the more significant cause of resource depletion— overpopulation or overconsumption?

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