Populations: Population Growth
Study Guide

TEXT READINGS
pp. 82-85

VOCABULARY

intrinsic growth rate  carrying capacity  basic reproductive rate  age-specific fecundity
exponential growth  logistic growth  density-dependent  density independent

STUDY QUESTIONS

1. Ignoring the effect of population density and the carrying capacity on population growth, why do living things tend to exhibit exponential population growth? What is the mathematical relationship that describes the shape of this curve (i.e., what determines the value of \( N_t \))? What is the mathematical relationship that describes the rate of growth (\( dN/dt \)) for this curve?

2. What is the mathematical relationship between \( r \) (the intrinsic natural rate of increase) and \( R_0 \) (the basic reproductive rate)? How does the value of \( r \) influence the rate of population growth (\( dN/dt \))? 

3. Draw a diagram that illustrates the logistic growth curve. Be sure you label the significant features of the diagram. Explain the shape of this growth curve.

4. What is the meaning of the term “\( dN/dt \)”? What is the mathematical relationship between \( dN/dt \) and population size (\( N \)) in logistic growth?

5. List and describe/explain as many examples of density-dependent factors influencing population growth as you can think of.