*Section 11.2 Changes in Population Size*

*ISP*

*Read pg. 509-518 and answer the questions below.*

1. What effect does birth rate have on per capita growth rate? Explain your answer. (K)
2. What are the four main processes that can cause changes in population size? Write an equation for the relationship among them. (K)
3. Why is immigration and emigration often not considered when determining the change in population size? (K)
4. An ecologist estimated 1500 individuals in a population of geese. Three years later the ecologist estimated 3600 individuals in the same population. Determine the growth rate of the population during this time interval. (T)
5. You are asked to catalogue several species by their life strategies. What criteria would you use to determine the predominant life strategy of each species? (T)
6. A researcher observing a certain population found that it could not grow to its biotic potential. Explain why, and predict the resulting curve that represents the researcher’s data. What do you think would happen if the researcher tries to control the environment to make it ‘ideal’? (A)
7. Weeds such as dandelions, have a r-selected life strategy. Use the characteristics of this type of strategy to explain why the term opportunistic population is suitable for these populations. (A)

ANSWER KEY

1. Birth rate increases the per capita growth rate, since birth rate reflects the rate at which new members enter the population
2. Birth, death, immigration, and emigration; ∆N = (B + I) - (D + E)
3. In most populations, immigration and emigration are about equal.
4. The growth rate is the change in population size over the specified time period (3 years): Change in population size: 3600 - 1500 = 2100 Growth rate = 2100/3 = 700 The growth rate is 700 geese per year.
5. Consider life span, age of sexual maturity, number of offspring in a reproductive cycle, and amount of parental care of each species.
6. A population does not grow to its biotic potential when resources become limited. As individuals spend energy competing for resources, growth slows. The resulting curve for the researchers’ data should be S-shaped (logistic growth pattern). If the researcher tries to control the environment to make it “ideal,” the population will likely live near its biotic potential and the researcher’s data will show a J-shaped curve (exponential growth pattern).
7. Populations with r-selected life strategies reproduce at an early age and have many offspring. Since they take advantage of favourable environmental conditions, such as sunlight and warm temperatures to live close to their biotic potential, the term opportunistic population is suitable.