Name _____

Date _____

Class _____

Chapter 4 – Population Biology

Section 4.1 – Population Dynamics

1. _____ – group of organisms, all of the same _____, which live in a specific area. A _____ population will grow and die at a relatively _____ rate unless it runs out of water, food, or space, or is attacked in some way by disease or predators.
    a. How fast do populations grow?
        i. _____ growth – as a population gets larger, it also grows at a _____ rate. _____ shaped curve
    b. Carrying capacity – _____ of organisms of one species that an environment can _____ indefinitely.
    c. Population Growth with a _____ Curve. See Figure 4.4 on page 94
        i. _____ growth - The initial increase is _____ because the number of reproducing individuals is _____.
        ii. _____ growth – There are _____ organisms, and many are reproducing, resulting in a faster increase in the number of individuals. Growth is exponential.
        iii. _____ off – As the population grows, more organisms are using the existing resources. Growth _____. Graph begins to resemble an _____
        iv. Carrying capacity – The environment can support this many organisms. If population size rises _____ the carrying capacity, _____ organisms die than are born. The population drops below the carrying capacity.
        v. _____ – The number of organisms tends to rise and fall around the carrying capacity due to _____ factors.
2. Reproduction Patterns
    a. _____ pattern
        i. _____-life history pattern
            1. Organisms tend to have _____ body size, mature _____, reproduce _____, have a _____ life span.
            2. Populations increase _____, then decline when environmental conditions suddenly _____ and become unsuitable for life. Small population that survives will reproduce exponentially when conditions are again _____.
            3. Example: _____
        ii. _____-life history pattern
            1. Organisms tend to have a _____ body size, mature _____, reproduce _____, and are long-lived.
            2. Populations are maintained at sizes at or near carrying capacity.

3. Example: _____

3. Density Factors and Population Growth
    a. Three patterns of dispersal: _____, _____, and _____.
    b. Two types of limiting factors that are related to dispersal
        i. Density-_____ factors
            1. Examples: disease, competition, predators, parasites, and food.
            2. These factors have an increasing effect as the population _____.
        ii. Density-_____ factors
            1. Examples: volcanic eruptions, temperature, storms, floods, drought, chemical pesticides, and major habitat disruption.
            2. These affect populations, _____ of their density.
4. Organism Interactions Limit Population Size
    a. _____ affects population size
        i. Populations of predators and their prey experience _____ or changes in their numbers over periods of time.
            1. _____ populations can affect the size of prey populations. _____ populations can affect the size of predator populations.
            2. In prey populations, the young, old, or injured members are caught. Predation _____ the chance that resources will be available for the remaining individuals in a prey population.
    b. _____ within a population
        i. Density-dependent factor
            1. When only a few individuals compete for resources, no problem arises. When a population increases to the point where _____ for resources exceeds the _____, the population size decreases.
    c. The effects of crowding and stress
        i. As populations increase in size in environments that cannot support increased numbers, animals can become _____.
            1. Symptoms of stress include: aggression, decrease in parental care, decreased fertility, decreased resistance to disease. All of these can have a negative effect (_____ factor) on a population.

Section 4.2 – Human Population

5. World Population
    a. _____ – study of human population size, density, distribution, movement, birth and death rates.
    b. Human population growth
        i. Humans can consciously _____ their environment. Combat diseases, make medical advancements, provide clean water, develop methods for producing more food.
            1. This allows people to live longer, produce more offspring, and cause population _____.
    c. Calculating growth rate
        i. _____ – number of live births per 1 000 population in a given year
        ii. _____ – number of deaths per 1 000 population in a given year.
        iii. _____ – movement of individuals into a population
        iv. _____ – movement out of a population
        v. Two formulas for Population Growth Rate (PGR):
            1. (Birthrate + Immigration rate) – (Death rate + Emigration rate)
            2. Birthrate – Death rate
                a. If the rate is _____ , the number of new individuals entering the population _____ the number of individuals that are leaving the population
                b. If PGR is greater than _____, the population is _____
                c. If PGR is _____ than zero, fewer individuals are entering the population than are leaving.
    d. _____ time – time needed for a population to double in size.
    e. Age structure – _____ of the population that are in different age levels.
        i. _____ growth – the percentage of people in each age category will be fairly equal
        ii. _____ growth – highest percentages will be seen among children and teens
    f. _____ and growth
        i. Sometimes a population grows more _____ than the available resources can handle. Food and water can become scarce or contaminated. Amount of waste produced becomes difficult to dispose of properly.
        ii. These conditions can lead to stress on current resources and contribute to the spread of diseases that affect the _____ of human populations