



Chapter 45 Exercises

Review Questions

- Which of the following methods will tell an ecologist about both the size and density of a population of immobile organisms?
 - mark and recapture
 - mark and release
 - quadrat
 - life table
- Which of the following is best at showing the life expectancy of an individual within a population?
 - quadrat
 - mark and recapture
 - survivorship curve
 - life table
- Humans have which type of survivorship curve?
 - Type I
 - Type II
 - Type III
 - Type IV
- How is a clumped population distribution beneficial for prey animals?
 - Being a member of a larger group provides protection for each individual from predators.
 - Prey animals rely on each other to acquire food.
 - Prey animals live in small family groups to raise young.
 - Clumped population distributions ensure that at least one member of the population knows how to identify the seasonal migration route.
- Which of the following is associated with long-term parental care?
 - few offspring
 - many offspring
 - semelparity
 - fecundity
- Which of the following is associated with multiple reproductive episodes during a species' lifetime?
 - semiparity
 - iteroparity
 - semelparity
 - fecundity
- Which of the following is associated with the reproductive potential of a species?
 - few offspring
 - many offspring
 - semelparity
 - fecundity
- Species with limited resources usually exhibit a(n) _____ growth curve.
 - logistic
 - logical
 - experimental
 - exponential
- The maximum rate of increased characteristic of a species is called its _____.
 - limit
 - carrying capacity
 - biotic potential
 - exponential growth pattern
- The population size of a species capable of being supported by the environment is called its _____.
 - limit
 - carrying capacity
 - biotic potential
 - logistic growth pattern
- Species that have many offspring at one time are usually _____.
 - r -selected
 - K -selected
 - both r - and K -selected
 - not selected
- A forest fire is an example of _____ regulation.
 - density-dependent
 - density-independent
 - r -selected
 - K -selected
- Primates are examples of _____.
 - density-dependent species
 - density-independent species
 - r -selected species
 - K -selected species

14. Which of the following statements does *not* support the conclusion that giraffes are *K*-selected species?
- Giraffes are approximately 6 feet tall and weigh 150 pounds at birth.
 - Wild giraffes begin mating at 6 to 7 years of age.
 - Newborn giraffes are capable of coordinated walking within an hour of birth and running within 24 hours of birth.
 - Giraffes rarely give birth to twins.
15. Which of the following events would *not* negatively impact Yellowstone's grey wolf carrying capacity?
- snow in winter
 - a beaver damming a river upstream
 - a forest fire
 - chronic wasting disease in the deer population
16. A country with zero population growth is likely to be _____.
- in Africa
 - in Asia
 - economically developed
 - economically underdeveloped
17. Which type of country has the greatest proportion of young individuals?
- economically developed
 - economically underdeveloped
 - countries with zero population growth
 - countries in Europe
18. Which of the following is *not* a way that humans have increased the carrying capacity of the environment?
- agriculture
 - using large amounts of natural resources
 - domestication of animals
 - use of language
19. The first species to live on new land, such as that formed from volcanic lava, are called _____.
- climax community
 - keystone species
 - foundation species
 - pioneer species
20. Which type of mimicry involves multiple species with similar warning coloration that are all toxic to predators?
- Batesian mimicry
 - Müllerian mimicry
 - Emsleyan mimicry
 - Mertensian mimicry
21. A symbiotic relationship where both coexisting species benefit from the interaction is called _____.
- commensalism
 - parasitism
 - mutualism
 - communism
22. Which of the following is *not* a mutualistic relationship?
- a shark using an aquatic cleaning station
 - a helminth feeding from its host
 - a bumblebee collecting pollen from a flower
 - bacteria living in the gut of humans
23. The ability of rats to learn how to run a maze is an example of _____.
- imprinting
 - classical conditioning
 - operant conditioning
 - cognitive learning
24. The training of animals usually involves _____.
- imprinting
 - classical conditioning
 - operant conditioning
 - cognitive learning

25. The sacrifice of the life of an individual so that the genes of relatives may be passed on is called _____.
- operant learning
 - kin selection
 - kinesis
 - imprinting
26. Why are polyandrous mating systems more rare than polygynous mating?
- Only males are capable of multiple rounds of reproduction within a single breeding season.
 - Only females care for the young.
 - Females usually experience more intrasexual selection pressure than males.
 - Females usually devote more energy to offspring production and development.

Critical Thinking Questions

27. Describe how a researcher would determine the size of a penguin population in Antarctica using the mark and release method.
28. The CDC released the following data in its 2013 Vital Statistics report.

Age Interval	Number Dying in Age Interval	Number Surviving at Beginning of Interval	Mortality Rate
0-10	756	100,000	
11-20	292	99,244	
21-30	890	98,953	
31-40	1,234	98,164	
41-50	2,457	96,811	
51-60	5,564	94,352	
61-70	10,479	88,788	

Calculate the mortality rate for each age interval and describe the trends in adult and childhood mortality per 100,000 births in the United States in 2013.

29. Why is long-term parental care not associated with having many offspring during a reproductive episode?
30. Describe the difference in evolutionary pressures experienced by an animal that begins reproducing early and an animal that reproduces late in its life cycle.
31. Describe the rate of population growth that would be expected at various parts of the S-shaped curve of logistic growth.
32. Describe how the population of a species that survives a mass extinction event would change in size and growth pattern over time beginning immediately after the extinction event.
33. Give an example of how density-dependent and density-independent factors might interact.
34. Describe the age structures in rapidly growing countries, slowly growing countries, and countries with zero population growth.
35. Since the introduction of the Endangered Species Act, the number of species on the protected list has more than doubled. Describe how the human population's growth pattern contributes to the rise in endangered species.
36. Describe the competitive exclusion principle and its effects on competing species.
37. Jaguars are a keystone species in the Amazon. Describe how they can be so essential to the ecosystem despite being significantly less abundant than many other species.
38. Describe Pavlov's dog experiments as an example of classical conditioning.
39. Describe the advantage of using an aural or pheromone signal to attract a mate as opposed to a visual signal. How might the population density contribute to the evolution of aural or visual mating rituals?