

STUDY GUIDE: Populations and Communities

(Campbell Chapters 46, 47 & 48)

KEYS TERMS

POPULATIONS

populations	clumped distribution	density-dependent
communities	natality	limitation
ecosystems	mortality	zero population growth
population	life span	carrying capacity(K)
characteristics	survivorship curves	maximum sustained
size	immigration	yield
census	emigration	density-independent
survey	age structure	limitation
index	exponential growth	r-selected species
density	curve	K-selected species
dispersion	intrinsic rate of	intraspecific competition
uniform distribution	increase(r)	interspecific competition
random distribution	logistic growth curve	

COMMUNITIES

Species diversity	niche
Competitive exclusion	niche separation
	habitat

INTERSPECIES RELATIONSHIPS

parasitism	commensalism	mimicry
predation	mutualism	

COMMUNITY DEVELOPMENT

succession	pioneer communities	climax community
primary succession	sere	
secondary succession	seral stages	

QUESTIONS:

1. Define population density. Give two methods biologists use to estimate population densities and distinguish between uniform, clumped, and random distributions, and indicate the conditions under which one is the most common.
2. Draw an exponential growth curve(J-shaped curve).
3. Draw a logistic growth curve(S-shaped curve), and label the carrying capacity, the inflection point, the portion of the curve showing an accelerating rate of population growth, and the portion showing a decelerating rate.
4. Explain how density-dependent and density-independent factors operate in limiting population growth.
5. On a single graph draw type I, type II, and type III survivorship curves. Explain each curve briefly at the bottom of the graph.

6. Construct a table showing the differences between r-selected species and K-selected species with respect to body size, life-span, number of offspring, relative time of reproduction (earlier or later in life), type of survivorship curve, type of growth curve (S-shaped or boom-and-bust).
7. Give examples of r and K species.
8. Using examples, discuss the ways in which parasitism, predation, intraspecific competition, emigration, mutualism, and physiological and behavioral mechanisms can act as density-dependent limitations on population growth. Explain, using an example, how destroying the balance between predator and prey in a community can upset the ecology of an area.
9. Carefully define the concept of ecological niche, and explain its significance with respect to the competitive exclusion principle. Specify the three possible results of intense interspecific competition.
10. Discuss, using an example, the relationship between species diversity and complexity and community stability.
11. Describe the effect of human intervention in biological communities.
12. Describe the process of ecological succession, indicating why the species in a given area change over time. Distinguish between primary and secondary successions, and give an example of each. Also, summarize the trends seen in many successions, and explain what is meant by a climax community.
13. Explain the types of interspecies relationships and tell how each member of the pair is affected by the interaction(include predation, parasitism, commensalism and mutualism).