# Unit 4 – Population Dynamics

## Chapter 14 - Population Ecology

1. Define the following terms: habitat, niche, species, population size, crude density and ecological density.
2. Describe the three ways that a population can be distributed and give an example of each.
3. Describe the circumstances in which quadrat sampling is the most appropriate.
4. Describe the mark-recapture method of estimating population size. What are the assumptions that are made when using this estimation method? What types of populations are best suited to this method of estimation.
5. Describe the types of methods that can be used to track organisms in the wild.
6. Discuss the ethics of capturing and marking wild animals. Do you believe that the scientific information that can be gathered from these studies outweighs the disturbance this may cause the organisms?
7. Describe the three generalized types of survivorship curves and give an example of a species that exhibits each.
8. Use data to calculate population change, geometric growth rate, exponential growth rate & logistic growth rate.
9. Define each of the following terms: open population, closed population, biotic potential and carrying capacity.
10. Describe the 3 distinct phases of a logistic growth curve.
11. Compare and contrast density-dependent and density-independent factors, giving examples of each.
12. Describe each of the following forms of interspecific competition: interference competition, exploitative competition, predation, parasitism, mutualism and commensalisms. Give at least one example of each.
13. Describe Gause's paramecium experiment and what it tells use about competitive exclusion.
14. Describe in detail three examples of resource partitioning in nature.
15. Discuss the interdependency of predator and prey populations. Explain the reason for the time lag that typically exists between population peaks of prey and predator.
16. Give examples of defense mechanisms used by organisms to protect themselves from harm.
17. Discuss the problem of introduced species. Give a detailed description of at least two examples of species that have been introduced to Ontario and the problems they have caused to local ecosystems.

## Chapter 15 - Human Populations

1. Describe the current pattern of human distribution in the world.
2. Summarize the historical changes in human population size and the developments that are responsible.
3. Explain how moving from a hunter gathering to an agricultural lifestyle affected human population growth.
4. Describe the impact of disease, science and medicine on human population growth.
5. Graph human population growth over the last 17 000 years. Calculate the doubling time of the population.
6. Identify the global regions in which growth is of particular concern. Identify the socioeconomic causes.
7. Describe the age structures of populations exhibiting differing growth rates. Define **growth momentum**.

8. Discuss possible methods of controlling population growth and discuss the relative effectiveness of each.
9. Describe the possible outcome of continued human population growth.
10. Describe the global differences in food availability and arable land. Is there enough food to feed everyone?
11. Use energy pyramids to visualize the transfer of food energy from one trophic level to the next.
12. Describe schemes for developing more sustainable food production.
13. Describe the threats to our drinking water supply and how the Walkerton deaths have changed policies.
14. Describe the following threats to our atmosphere: global warming, acid rain and ozone depletion.
15. Describe what is meant by **systems thinking** and how this can help us deal with ecological problems.
16. Compare and contrast the ecological impact of people in developed and developing countries.