Predation, Herbivory, and Parasitism

Part 1: Natural History of Exploitation
Types of species interactions. Categorizing parasitic lifestyles. Prey and plant defenses to exploitation.

- Exploitation Is All Around
- Types of Species Interactions
- Parasitism
- Ecological Impacts of Parasitism
- Herbivory
- Plant Defenses Against Herbivory
- Impacts of Herbivory on Plant Communities
- Predation
- Animal Defenses Against Predation
- Summary of Part 1
- Quiz Questions
- Questions About Concepts?

Part 2: Predator-Prey Dynamics
Predator-prey cycles and the Lotka-Volterra predator-prey equation. The effect of predation rate and other rates on cycling and extinction risk. Interactions between food availability and predation.

- A Classic Case: Lynx and Hare
- Prey Dynamics: Modeling Hare
- Predator-Prey Dynamics: Modeling Hare + Lynx
- Predator-Prey Population Cycling
- Cycling and Extinction
- Interactions Among Trophic Levels
- Summary of Part 2
- Quiz Questions
- Questions About Concepts?

Part 3: Lotka-Volterra and Beyond
Phase planes and isoclines visualize mathematical models. Assumptions of the Lotka-Volterra model. Effects of density dependence. Prey refuges and metapopulation dynamics.

- Predator-Prey Dynamics in a Complex World
- The Phase Plane
- Phase Portrait: Understanding Predator-Prey Dynamics
- Zero Growth Isoclines in a Lotka-Volterra World
- Adding Complexity to the Lotka-Volterra Model
- Prey Density Dependence

- A More Realistic Predator Population
- Adding Heterogeneity: Prey Refuges
- Metapopulations
- Summary of Part 3
- Quiz Questions
- Questions About Concepts?

Part 4: Functional Responses to Exploitation
Type I, II, and III functional response curves. Functional response and the environment.

- In Search of an Easy Meal
- Functional Response Types
- Exploring Functional Responses with Models
- Biocontrol via Functional Response
- Impacts of Environmental Conditions
- Summary of Part 4
- Quiz Questions
- Questions About Concepts?

Part 5: The Evolutionary Arms Race
Coevolution between parasites and hosts. Mutation rate and disease dynamics. Coevolution and the Red Queen hypothesis.

- Together Through Time
- Topminnows and Their Parasites
- Coevolution
- Predator-Prey Coevolution
- Sex and the Red Queen Hypothesis
- Summary of Part 5
- Quiz Questions
- Questions About Concepts?