UNIT OVERVIEW

ECOLOGY

Unit Issue: The environmental impacts of introduced species.

Anchoring Phenomenon: Introduced species are changing environments all around us.

Listed below is a summary of the activities in this unit. Note that the total teaching time is listed as 29–34 periods of approximately 45–50 minutes (approximately 6–7 weeks). If you find you cannot finish in this time frame, consider skipping activities 5 and/or 13.

Activity Description	Topics	Advance Preparation	Assessment	Teaching Periods
1. **Talking it Over: The Miracle Fish?** Students read and discuss what happened after the Nile perch was introduced into Lake Victoria.	ecology, evidence, trade-offs, introduced species SENSEMAKING	Send drop card for blackworms (need by Activity 5) and *Paramecium* (Activity 9); prepare Student Sheet.	ARG QUICK CHECK A6 E&T A7	2
2. **Project: Introduced Species** After learning about eight species that have been introduced into the United States; students begin research to be presented later in the unit (Activity 16).	ecology, introduced species, ecosystem, biodiversity	Gather research resources; decide logistics, schedule, and timeline for research projects; prepare Student Sheet.	To be assessed at a later date: EXP: Introduced Species Research, and COM: Introduced Species Reports	2
3. **Investigation: Data Transects** Students use a model of a transect to compare organisms found in two different physical environments located in a prairie.	ecology, transects, ecological relationships, ecosystem components, restoration	Prepare Student Sheet.	3 AID QUICK CHECK A3	2
4. **Investigation: Taking a Look Outside** Students explore patterns in their local environment by using the transect method learned in the previous activity.	ecology, transects, abiotic and biotic ecosystem components, ecological relationships	Identify one or more suitable field sites; obtain hygrometer or sling psychrometer (optional).	PCI Proc. ODA Proc. QUICK CHECK	2–3
5. **Laboratory: A Suitable Habitat** Students plan and conduct a laboratory investigation to explore blackworms' responses to different habitats.	ecology, habitat, habitat requirements, adaptation LITERACY	Request blackworm shipment 2–3 weeks in advance; obtain spring water or de-chlorinated tap water, aquatic leaf litter, fish food.	PCI Proc. ARG A2	2
6. **Investigation: Ups and Downs** Students graph and interpret population data over time.	population size, population fluctuation, MATHEMATICS	Obtain transparent tape (optional); obtain visual aid; prepare Student Sheet.	ARG A1 AID A3	2
7. **Laboratory: Coughing Up Clues** Students gather information on owl diets and the owl's place in a food web as students dissect owl pellets.	food web, predator, prey, competition, energy flow	Obtain glue and cardboard (optional); prepare visual aid; prepare Student Sheet.	EXP A1 QUICK CHECK A2	1–2

ECOLOGY (continued)

Activity Description	Topics	Advance Preparation	Assessment	Teaching Periods
8. **Reading: Eating for Matter and Energy** Students read the text on food webs and the flow of energy through them. They create a model to explain the dissipation of energy from one level to the next.	food web, energy flow, matter, producers, consumers, predator, prey LITERACY	Obtain materials for student models, such as stickers, colored markers, paper, graduated cylinders, and beakers.	EXP A2 MOD QUICK CHECK A3	2–3
9. **Laboratory: Population Growth** Students use microscopes to compare populations of *Paramecium* that have been growing in environments with different amounts of food.	population growth, resource availability, competition	Request *Paramecium* shipment 2–3 weeks in advance; obtain visual aid; obtain spring water or de-chlorinated tap water, paper towels, milk and toothpicks (optional); need microscopes.	AID A3 (Assessment of PE MS-LS2-1)	2
10. **Investigation: Interactions in Ecosystems** Students interpret data from graphs and match them to ecological scenarios describing patterns of interaction that affect population sizes.	interactions, predator, prey, competition, symbiosis, mutualism, commensalism, parasitism LITERACY	Prepare Student Sheets.	EXP Proc. (Assessment of PE MS-LS2-2) QUICK CHECK A1	1
11. **Laboratory: Cycling of Matter** Students investigate the role of decomposers while isolating and examining nematodes in soil samples. Students study decomposition in a small classroom compost container.	decomposers, decomposition, cycling of matter, producers, consumers, food web	Obtain soil samples; need microscopes.	MOD QUICK CHECK A1	2
12. **Modeling: Modeling the Introduction of a New Species** Students work in groups to model a food web using a set of organism cards. They are then given an additional card representing an introduced species and must revise their models.	cycling of matter, flow of energy, ecosystem, food web	Obtain materials for student ecosystem models, such as string, stickers, and paper.	MOD Proc. (Assessment of PE MS-LS2-3)	2
13. **Investigation: Abiotic Impacts on Ecosystems** Students investigate a model of large-scale ecosystem disruption by arranging cards showing the effects of a large forest fire.	disruptions, dynamics, resilience, ecosystem, succession	Prepare Student Sheet.	EXP A3	1–2
14. **Investigation: Effects of an Introduced Species** Students use a Web-based graphing tool to graph and analyze a large data set on zebra mussels and their effects on several ecosystem components.	introduced species, ecosystem, dynamics, disturbance, disruption, biodiversity	Arrange access to multiple computers with Internet access.	ARG A1, A2 (Assessment of PE MS-LS2-4)	2

ECOLOGY (continued)

Activity Description	Topics	Advance Preparation	Assessment	Teaching Periods
15. **Talking it Over: Too Many Mussels** Students evaluate control options to address the problems caused by zebra mussels for humans and ecosystems.	engineering, design, solution, criteria, constraints, ecosystem services, biodiversity	Prepare Student Sheets.	ARG A1a (Assessment of PE MS-LS2-5) E&T A1b ENG QUICK CHECK SS 15.2	2
16. **Project: Introduced Species** Student groups present their introduced species research. The class discusses the characteristics of an introduced species that make it likely to proliferate in a given ecosystem.	ecosystem, ecology, food web, introduced species, competition, predator, prey, engineering, solution, biodiversity, ecosystem services	Prepare Student Sheet.	COM Presentations EXP Written Report	2–3