



Ecology

Explore fundamental concepts in ecology, from the nature of ecosystems and the basics of ecosystem structure and function, to the complex relationships within and between species and between humans and their environment.

Suitability:

- Grades 10-12
- Community College

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Biozone's unique formula encourages self direction, while dovetailing with traditional resources.

Chapters

- Ecosystems
- Energy Flow & Nutrient Cycles
- The Dynamics of Population
- Practical Ecology
- Classification
- Changes in Ecosystems

Features

- **Introduction to the topic:**
A concise introduction to the concepts in the activity.
- **Easy to understand diagrams:**
Highly visual, clearly annotated diagrams improve the accessibility of information.
- **Consolidation and branching out:**
Activities provide information to consolidate basic knowledge, while allowing scope for exploring. Differential instruction becomes easier and students at all levels are encouraged to be 'thinkers'.
- **Write-on format:**
Activities provide information to consolidate basic knowledge, while allowing scope for exploring.
- **Tear-out pages:**
Each page has a perforation to allow easy removal for marking, or placement in a ring binder.
- **Activity Code:**
Each activity is coded to identify the skills required for its completion.

Shoreline Zonation

Describe zonation in the absence of an ecosystem. The diagram shows the zonation of a rocky shore. The diagram shows the zonation of a rocky shore. The diagram shows the zonation of a rocky shore.



Shoreline Zonation Patterns

The diagram shows the zonation of a rocky shore. The diagram shows the zonation of a rocky shore. The diagram shows the zonation of a rocky shore.

Key to species

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1. Explain why the zone of exposure above water is a major factor controlling species distribution on a rocky shore.

2. Identify two other abiotic factors that might influence species distribution on a rocky shore.

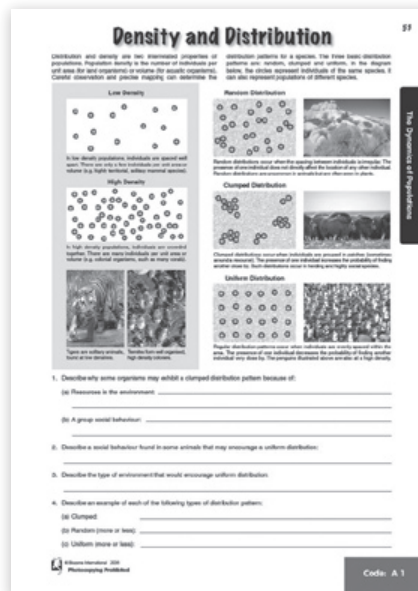
3. Identify two biotic factors that might influence species distribution on a rocky shore.

4. Describe the zonation pattern on a rocky shore.

Code: A 1

Density and Distribution

Describe and identify the two main types of population distribution patterns. The diagram shows the zonation of a rocky shore. The diagram shows the zonation of a rocky shore.



Uniform Distribution

Individuals are evenly spaced. This is often seen in territorial animals.

Clumped Distribution

Individuals are grouped together. This is often seen in social animals.

Random Distribution

Individuals are scattered randomly. This is often seen in plants.

1. Describe why some organisms may exhibit a clumped distribution pattern because of:

(a) Resource in the environment _____

(b) A group social behaviour _____

2. Describe a social behaviour found in some animals that may encourage a uniform distribution _____

3. Describe the type of environment that would encourage uniform distribution _____

4. Describe an example of each of the following types of distribution pattern:

(a) Clumped _____


(b) Uniform (even or long) _____

(c) Uniform (short or long) _____

Code: A 1

Transect Sampling

A transect is a line placed across a community of organisms. The diagram shows the zonation of a rocky shore. The diagram shows the zonation of a rocky shore.



Point sampling

Individuals are counted at specific points along the transect.

Continuous belt transect

Individuals are counted at every point along the transect.

Interrupted belt transect

Individuals are counted at regular intervals along the transect.

1. Explain how you could use a transect to sample a community.

2. Describe the advantages of belt transects.

3. Explain why the transects may give an unrealistic sample of the community in question.

4. Explain how belt transects overcome this problem.

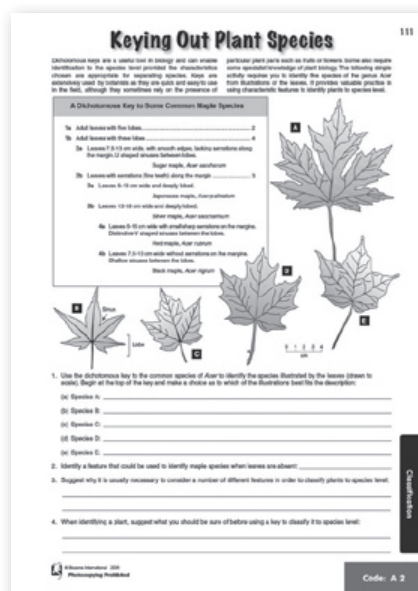
5. Describe a situation where the use of transects to sample the community would be inappropriate.

6. Explain how you could use whether or not a transect sampling interval was subject to accurately sample a community.

Code: DA 2

Keying Out Plant Species

Describe the key to identify common maple species. The diagram shows the zonation of a rocky shore. The diagram shows the zonation of a rocky shore.



A Dichotomous Key to Some Common Maple Species

1. Add leaves with the lobes.
2. Add leaves with three lobes.
3. Leaves 5-10 cm wide with smooth edges, lobes sometimes along the margin. 12 angled veins between the lobes. Silver maple, Acer glabrum.
4. Leaves with serrated lobes along the margin. 3-5. Leaves 6-10 cm wide and deeply lobed. Approximate, Acer pennsylvanicum.
5. Leaves 10-15 cm wide and deeply lobed. Silver maple, Acer saccharinum.
6. Leaves 6-10 cm wide with smooth edges, lobes sometimes along the margin. Distinctly angled veins between the lobes. Striped maple, Acer glabrum.
7. Leaves 7-12 cm wide with smooth edges on the margin. Distinctly angled veins between the lobes. Black maple, Acer glabrum.

1. Use the dichotomous key to the common species of Acer to identify the species illustrated by the leaves (shown in black). Sketch at the top of the key and make a choice as to which of the illustrations best fits the description.

(a) Species A _____

(b) Species B _____

(c) Species C _____

(d) Species D _____

(e) Species E _____

2. Identify a feature that could be used to identify maple species when leaves are absent.

3. Suggest why it is usually necessary to consider a number of different features in order to identify plants to species level.

4. When identifying a plant, suggest what you should be sure of before using a key to classify to species level.

Code: A 2

Content Overview

ECOSYSTEMS

- Biomes
- Components of an Ecosystem
- Habitats
- Law of Tolerances
- Dingo Habitats
- Physical Factors and Gradients
- Community Change With Altitude
- Shoreline Zonation
- Stratification in a Forest
- Ecological Niche
- Ecological Niches
- Adaptations to Niche
- Competition and Niche Size

ENERGY FLOW & NUTRIENT CYCLES

- Energy in Ecosystems
- Plant Productivity
- Food Chains
- Pesticides and Bioaccumulation
- Constructing a Food Web
- Dingo Food Webs
- Energy Inputs and Outputs
- Energy Flow in an Ecosystem
- Ecological Pyramids
- The Carbon Cycle
- The Nitrogen Cycle
- The Phosphorus Cycle
- The Water Cycle

THE DYNAMICS OF POPULATION

- Features of Populations
- Density and Distribution
- Population Regulation
- Population Growth
- Life Tables and Survivorship
- Survivorship Curves
- Population Growth Curves
- Growth in a Bacterial Population
- r and K Selection
- Population Age Structure
- Species Interactions
- Predator-Prey Strategies
- Niche Differentiation
- Interspecific Competition
- Intraspecific Competition
- Predator-Prey Interactions

PRACTICAL ECOLOGY

- Sampling Populations
- Designing Your Field Study
- Monitoring Physical Factors
- Indirect Sampling
- Quadrat Sampling
- Quadrat-Based Estimates
- Sampling a Leaf Litter Population
- Transect Sampling
- Mark and Recapture Sampling
- Sampling Animal Populations
- Sampling Using Radio-tracking
- Monitoring Change in an Ecosystem
- Using Chi-Squared in Ecology

CLASSIFICATION

- Features of Taxonomic Groups
- Features of the Five Kingdoms
- Features of Microbial Groups
- Features of Macrofungi and Plants
- Features of Animal Taxa
- Classification System
- Classification Keys
- Keying Out Plant Species

CHANGES IN ECOSYSTEMS

- Environmental Change
- Ecosystem Stability
- Ecological Succession
- Wetland Succession
- Pollution
- Global Warming
- Loss of Biodiversity



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