

Invasive Species and Human Impact in Alberta Ecosystems

Science 9

Unit A: Biological Diversity (Environmental Emphasis)

Topic: Invasive Species Impacts

Time: 45-90 mins

Outcome for STS and Knowledge: Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making. (Alberta Education, 2003).

Skills Outcomes: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions (Alberta Education, 2003).

Attitude Outcomes: Show interest in science-related questions and issues, and confidently pursue personal interests and career possibilities within science-related fields (Alberta Education, 2003).

Learning Objectives:

By the end of this lesson, students will be able to:

1. Describe what invasive species are and explain how human actions contribute to their spread in Alberta ecosystems.
2. Investigate and analyze how invasive species impact biodiversity and ecosystem stability through inquiry and data interpretation.
3. Evaluate and propose strategies for preventing or managing invasive species, considering both personal and community responsibility.

Time	EPIBA	Purpose	Activity	Assessment
10-15	Engage	Spark curiosity and connect learning to real-world issues.	Link to Google Slides: here Display images of invasive species in Alberta (e.g., zebra mussels, goldfish, flowering rush, Prussian carp). Ask: <ul style="list-style-type: none">• What do you notice about these organisms?	Questioning



			<ul style="list-style-type: none"> Why might these species be a problem in Alberta? How do you think they got here? <p>Play a short video or news clip showing an invasive species affecting Alberta waterways or parks.</p> <p>Transition: Explain that today's lesson explores how human actions influence ecosystems and what role we play in managing species survival and biodiversity.</p>	
10	Prior Learning Check	Connect new learning to previous knowledge of ecosystems, adaptation, and biodiversity.	<p>Quick review/discussion:</p> <p>What is biodiversity?</p> <p>What factors can affect a species' survival?</p> <p>What do we already know about introduced or non-native species?</p> <p>Students create a short concept map linking humans, species survival, and ecosystem balance.</p>	Diagnostic
15-20	Introduce	Provide core content and examples for foundational understanding.	<p>Define: Invasive species, native species, and introduced species.</p> <p>Discuss the pathways invasive species use to enter Alberta (e.g., boating, aquariums, horticulture, ballast water).</p> <p>Present real Alberta case studies:</p> <ul style="list-style-type: none"> Zebra mussels in water systems Goldfish and/or Prussian carp in storm ponds Himalayan balsam along riverbanks <p>Highlight how human actions (transportation, trade, recreation) contribute to their spread.</p>	Formative: Understanding of invasive species concepts

<p>20 -25</p>	<p>Build</p>	<p>Deepen understanding through investigation and problem-solving.</p>	<p>Activity</p> <ol style="list-style-type: none"> 1. Design your own invasive species: Link <p>Students in small groups will follow the instructions on the design your own invasive species activity.</p> <ol style="list-style-type: none"> 2. Invasive Species Web Quest <p>Students research 3 different invasive species of their choosing through trusted Alberta websites to further understand how they got here, their impact on the environment, and what we can do to control it.</p> <p>Skill Development: Students practice asking questions, gathering data, and drawing evidence-based conclusions.</p>	<p>Formative: Inquiry skills and data interpretation</p>
<p>20 -30</p>	<p>Apply</p>	<p>Transfer knowledge to new contexts and encourage decision-making.</p>	<p>Groups propose a Public Awareness Campaign to prevent the spread of an invasive species in Alberta.</p> <p>Include:</p> <ul style="list-style-type: none"> ● Target audience (e.g., boaters, gardeners, pet owners) ● Key messages or slogans ● Actions individuals can take ● Present ideas to the class or create posters/social media mockups. <p>Use a rubric to evaluate:</p> <ul style="list-style-type: none"> ● Understanding of invasive species impacts ● Use of scientific reasoning and evidence ● Creativity and application of knowledge 	<p>Summative: Application to real-world problem solving and communication</p>