



Lesson Plan: Integrated Waste Management, Grade 11 Environmental Science (SVN3M)

Introduction

Students will learn about Durham Region's Long-term Waste Management Plan and complete an in-depth analysis of the entire life cycle of a chosen product. A life cycle analysis is conducted to evaluate the environmental impact of a product through its entire life cycle - this includes the material extraction and processing of the raw materials, manufacturing, distribution (packaging and transport), use, and the final disposal (end of life).

Learning Objectives

1. Demonstrate and understanding of integrated waste management and the waste hierarchy
2. Investigate the effectiveness of various waste management practices
3. Develop critical thinking skills in relation to waste products
4. Evaluate the short- and long-term impact on the environment of a specific type of waste through the development of a life cycle analysis

Resources Provided (located in the resource folder)

- Infographics:
 - How does Durham Region currently manage waste?
 - What we have accomplished over the last 20 years
 - What will impact our waste management decisions over the next 20 years
 - Waste hierarchy
 - Thinking about a product life cycle
 - What is a circular economy?

Questions

1. How effective was waste management in the past?
2. Where did the Region's black bag garbage go in the past versus where it goes today?
3. What is household hazardous waste and what potential environmental / human health / safety concerns are associated with improper disposal of these materials?
4. How does public perception play into the development and implementation of waste management programs?
5. How might NIMBYISM and BANANA affect local efforts in sustainable waste management?
6. What are some strategies to encourage or enforce the public to change behaviours when it comes to waste management?

The Regional Municipality of Durham - Waste Management Services

If this document is required in an accessible format, please contact schoolprograms@durham.ca

Activity

Students are now waste management staff and have been asked to prepare a memo to senior management regarding the economic, political, and environmental considerations affecting the placement of a new household hazardous waste depot within the Region.

Household hazardous waste includes household products for disposal that can catch fire, react, or explode under certain circumstances, or toxic or corrosive properties. Some examples of common household hazardous waste include paints and solvents, propane tanks, household chemicals and cleaners and batteries.

1. Students will prepare their memos following the template provided.
2. Students will submit their memos for teacher review/comment.

Summary

Waste does not just disappear once it leaves your house. It needs to be managed responsibly to protect the environment and human health. While NIMBYISM and BANANA opposition may occur when planning and implementing waste management programs and strategies, Durham Region believes we should strive to manage the waste we create as residents in our own borders. How we choose to manage waste today impacts the future.

Curriculum Connections Expanded

The Ontario Curriculum, Grades 11 and 12: Science, 2008 (revised)

Environmental Science, Grade 11, University/College Preparation (SVN3M)

A. Scientific Investigation Skills and Career Exploration

- A1. Scientific Investigation Skills: demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating)

B. Scientific Solutions to Contemporary Environmental Challenges

- B1. Relating Science to Technology, Society, and the Environment: analyse social and economic issues related to an environmental challenge, and how societal needs influence scientific endeavours related to the environment
- B2. Developing Skills of Investigation and Communication: investigate a range of perspectives that have contributed to scientific knowledge about the environment, and how scientific knowledge and procedures are applied to address contemporary environmental problems
- B3. Understanding Basic Concepts: demonstrate an understanding of major contemporary environmental challenges and how we acquire knowledge about them

C. Human Health and the Environment

- C1. Relating Science to Technology, Society, and the Environment: analyse initiatives, both governmental and non-governmental, that are intended to reduce the impact of environmental factors on human health
- C2. Developing Skills of Investigation and Communication: investigate environmental factors that can affect human health, and analyse related data

The Regional Municipality of Durham - Waste Management Services

If this document is required in an accessible format, please contact schoolprograms@durham.ca

- C3. Understanding Basic Concepts: demonstrate an understanding of various environmental factors that can affect human health and explain how the impact of these factors can be reduced

E. Reducing and Managing Waste

- E1. Relating Science to Technology, Society, and the Environment: analyse economic, political, and environmental considerations affecting waste management strategies
- E2. Developing Skills of Investigation and Communication: investigate the effectiveness of various waste management practices
- E3. Understanding Basic Concepts: demonstrate an understanding of the nature and types of waste and strategies for its management

F. Conservation of Energy

- F1. Relating Science to Technology, Society, and the Environment: assess the impact on society and the environment of the use of various renewable and non-renewable energy sources, and propose a plan to reduce energy consumption
- F3. Understanding Basic Concepts: demonstrate an understanding of energy production, consumption, and conservation with respect to a variety of renewable and non-renewable sources