

LESSON PLAN

Financial Literacy in Grade 11 Environmental Science

Environmental Science (SVN3M)

Connections to Financial Literacy

Following a waste audit in their school, students will use scientific investigation skills to develop and implement an action plan to increase recycling behaviour in their school. They will address the economic and environmental impact of increasing recycling in their school. They will also propose methods of evaluating the effects of their action plans.

Curriculum Expectations

A. Scientific Investigation Skills and Career Exploration

A1. demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analyzing and interpreting, and communicating)

- A1.1** formulate relevant scientific questions about observed relationships, ideas, problems, or issues, make informed predictions, and/or formulate educated hypotheses to focus inquiries or research
- A1.7** select, organize, and record relevant information on research topics from a variety of appropriate sources, including electronic, print, and/or human sources, using suitable formats and an accepted form of academic documentation
- A1.9** analyse the information gathered from research sources for logic, accuracy, reliability, adequacy, and bias
- A1.11** communicate ideas, plans, procedures, results and conclusions orally, in writing, and/or in electronic presentations, using appropriate language and a variety of formats (e.g., data tables, laboratory reports, presentations, debates, simulations, models)

E. Developing Skills of Investigation and Communication

E2. investigate the effectiveness of various waste management practices

- E2.4** plan and conduct a waste audit within their school, and propose a plan of action for waste reduction based on their findings (e.g., review the school's policy regarding paper and plastic recycling, monitor actual practices, and propose strategies to improve them) [IP, PR, AI, C]

Related Expectations:

E1. Relating Science to Technology, Society, and the Environment

- E1.1** analyse economic, political, and environmental considerations affecting waste management strategies

Learning Goals

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

- use scientific investigation skills to develop strategies to encourage recycling and investigate their effectiveness.
- develop an action plan to encourage recycling.

Sample Success Criteria

- I can use strategies such as developing a moveable recycling station which increases ease of recycling.
- I can use strategies such as posters and placemats to build understanding and promote awareness about recycling.
- I can explain why the action plan developed by our group will effectively encourage recycling in our school.
- I can develop a method to evaluate the effectiveness of our recycling plan that relies on quantitative and qualitative data.

Instructional Components and Context

Readiness

- Students will have previously completed a waste audit in their school and have data on the extent to which students recycle in the school.
- Students will be familiar with evaluation methodology (e.g., determining the goal of a program, determining methods of measuring effectiveness of a program, carrying out the measurement and evaluating the results).
- Students may require additional research time to explore the economic and environmental impact of recycling in their school. For example, students may need to research the costs of processing recycled goods in comparison to processing garbage. They may also need to research the specific costs to the school/school board for processing garbage and recycling.

Terminology

- Sustainability
- Recycling

Materials and Resources

- Results of previously completed waste audit
- Supplies that may be required in small group activity (e.g., art supplies, paper, small tools, etc.)

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Minds On

Whole Class/Pairs → Discussion

- Refer students to results of their previously completed school waste audit.
- Remind students that recycling was identified as one strategy to use to reduce the amount of waste produced in the cafeteria. The goal for the upcoming assignment is to communicate to our school community the importance of recycling from a variety of perspectives (e.g., scientific, environmental, economic, citizenship).
- In pairs, students discuss the issues that need to be addressed in order to get the message across (e.g., awareness of the problem, information about how to sort recycling, need to make it easy to recycle). Pairs share their ideas with the whole class.
- Discuss the actions that can take place to make students aware of the economic and environmental short- and long-term impacts of recycling on individuals, the school and community (e.g., using food containers for lunch versus purchasing pre-packaged food). How do we communicate these ideas to our fellow students? (e.g., promotion, information, and ease of use).

Connections

Guiding Questions

- What are some of the barriers to complete recycling?
- What can be done to overcome those barriers?

A₁ L Assessment for Learning

From the discussion, determine the extent to which students are familiar with some of the barriers to recycling.

Action!

Small Groups → Develop an Action Plan

- Divide students into 3 groups:
 1. Media Relations (Promotion) – This group will be responsible for creating a media campaign to promote recycling throughout the school community. One suggestion is that they create information posters using recyclable materials they have found around the school.
 2. Information Services – This group will be responsible for educating the school community about which packaging should be recycled and which should go into the garbage. One suggestion is that they develop laminated placemats to be placed on the tables in the cafeteria to inform students about what packaging can be recycled.
 3. Ease of Use – This group will be responsible for creating a program that will make it easy for all students to recycle in the school. One suggestion is to create a mobile recycling unit which can be pushed around the cafeteria to allow students to sort their recyclable packaging.
- Each group develops an action plan which they present to the rest of the class. Their action plans should provide an explanation of the environmental and economic impact of their plan. Students provide feedback about the extent to which they feel the action plan will increase recycling behaviour in the school. They discuss potential cost savings associated with each of their action plans. Each group considers the peer feedback before finalizing and carrying out their action plan.

Connections

A₂ L Assessment for Learning

Review students' explanations of the economic and environmental impact of their action plan.

A₃ L Assessment as Learning

Peer feedback on action plans.



D Differentiated Instruction

Students can choose which of the three projects they would like to work on, based on interest. Alternatively, student groups can be pre-selected by the teacher based on their learning style.

Consolidation

Small Groups → Discussions

In a small group discussion, students reflect on the following questions:

- How has this activity influenced our commitment to the environment?
- What are the economic impacts of recycling waste products rather than throwing them in the garbage?
- What are the costs associated with recycling?

As a next step, students develop a plan for evaluating the effectiveness of their recycling action plan. They consider the following questions:

- What is our hypothesis? (Sample responses: more people will be aware of the importance of recycling, there will not be a significant increase in recycling)
- What do we want to measure? (Sample responses: raised awareness, shifts in attitude, behaviour change)
- What strategies can we use to measure? (Sample responses: focus groups, surveys, data collection with a follow-up waste audit)

Connections

A₄ L Assessment of Learning

Assess students' understandings of the connections between the environment and the economy.

A₅ L Assessment of Learning

Assess students' evaluation plans according to co-constructed criteria (e.g., hypotheses are specific and measurable, the selected measures make sense).