“Chilling Out” – Lesson Plan 2

Title: Structures and Mechanisms – Mechanical Efficiency - Origins of Home Refrigeration

Recommended Time Requirement: 4 class periods
- 50 minutes to explore how the home refrigerator has changed our lives using the “Chilling Out” virtual exhibit and other resources
- 50 minutes to examine how an electric home refrigerator works
- 50 minutes to research and plan an editorial on electric versus gas refrigerators
- 50 minutes to write an editorial and share it with a partner

Student Scenario
You will be writing an editorial for your local paper in 1927, supported with scientific facts, discussing the advantages and disadvantages of the “refrigerator” for citizens in your community.

Intended Grade Level / Subject Matter Areas:
Science – Grade 8 Structures and Mechanisms – Mechanical Efficiency; Language Grade 8 – Oral and Visual Communication

Concepts
Factors that contribute to efficient operation of a mechanism and that affect the manufacturing of the refrigerator

Instructional Outcomes
Students will be able to:
- identify the personal and societal factors that determine whether a product is used;
- explain the economic, social, and environmental factors that can determine whether a product is manufactured (e.g., costs of materials and equipment, availability of skilled labour, potential harmfulness of the product);
- make informed judgements about products designed and made by others;
- evaluate their own designs against the original need, and propose modifications to improve the quality of the products.

TEACHER INSTRUCTIONS

Prior knowledge and skills required
To complete this task, students should have some knowledge or skills related to the following:
- the following terms: *icebox, refrigerator, technology*,
- using research materials to creat point-form notes
- working with primary and secondary sources
- developing and creating a supported opinion piece (editorial)

Materials and resources required
- copy of the Student Worksheet

Task instructions

Introductory activities:

Pre-task 1: Changing Lives Through Technology (50 minutes)

1. Link to the HVACR Heritage Centre of Canada "Chilling Out" exhibit at http://pilot.hhc-canada.net/. With the class, read the section on "Changing Lives" and clarify and language or concepts through discussion.
2. Tell students that with the help of the Internet, they will be going back in time. The journey begins in the year 1900 and takes them to 1998. Refer students to the Science Odyssey Web site http://www.pbs.org/wgbh/aso/tryit/tech/#. Ask students to record technological advances in the refrigerator beginning with the year 1900. The journey can be presented as a teacher led activity, in student pairs, or independently, depending on computer/internet access. You may wish to use the Student Worksheet provided.
3. After completing the journey, ask students to verbally share with their class their responses on the activity sheet.
4. Discuss the issues surrounding the technology of the refrigerator. You might like to use the following question to get started:
   - Compared to the use of an icebox, in what ways did the development of the modern refrigerator change our lives?

Pre-task 2: How a refrigerator works

1. Link to the HVACR Heritage Centre of Canada's "Chilling Out" exhibit at http://pilot.hhc-canada.net/. Working in pairs, students review the "How It Works" section. Their goal is to identify the components of a modern refrigerator and the order in which they work. Students should learn the refrigerator part name and its function.
2. Have students shut down computers and provide them with the refrigerator puzzle pieces, constructed from Teacher Worksheet. Match the refrigerator part with its function.

Pre-task 3: Alternate technologies – Gas and electric refrigerators

1. Refer students to Canada Science and Technology Museum's background article on Domestic Technology for a discussion of gas versus electric refrigerator technology http://www.sciencetech.technomuses.ca/english/schoolzone/Domestic_Technology2.cfm#fridge. Have students work in pairs, reading the article and taking point-form notes of key questions and ideas. Explain the students will use these notes in a class discussion of the issues.
2. Discuss the issues surrounding the choice of the electric refrigerator. You might like to use the following questions to get started:
   - What were the pros and cons of gas and electric refrigerators?
   - What is interesting about this?
   - What is important about this topic?
   - What ideas caught your attention?
   - Why does this matter to us today?

Task: Write an editorial for your local paper in 1927, supported with scientific facts, discussing the advantages and disadvantages of the "refrigerator" for citizens in your community.

1. Each student should plan and write a brief editorial using the format for the development of a supported opinion piece. You might suggest they review online examples of editorials from the period for inspiration (listed under Resources below)
2. Have each student plan and write and editorial.
3. Working in pairs, student read one another's editorial and discusses question: "Would this editorial encourage you to buy a refrigerator? Why or why not? What changes might this purchase make in your style of life?"

RESOURCES

- Canadian history text books
- Links

  "Changing Lives" and "How It Works" sections of "Chilling Out: Origins of Home Refrigeration" http://pilot.hhc-canada.net/

  Science Odyssey http://www.pbs.org/wgbh/aso/tryit/tech/#

  Canada Science and Technology Museum's background article on Domestic Technology
  http://www.sciencetech.technomuses.ca/english/schoolzone/Domestic_Technology2.cfm#fridge

  Gas refrigeration – "How stuff works"
  http://home.howstuffworks.com/refrigerator5.htm

  The Toronto Star – Pages of the Past
  http://thestar.pagesofthepast.ca/