

Financial Literacy: Grade 8 Science and Technology Systems in Action

Lesson 1 – Considering Automation

Students develop an awareness of the variety of products that can be crafted by hand as well as mass manufactured through automated processes. They examine some of the advantages and disadvantages of each process with a particular product of their choice.

Connections to Financial Literacy

The financial literacy knowledge and skills which will be addressed and assessed in this lesson include:

- consumer awareness
- personal financial awareness such as making purchases for the home or for hobbies
- implications that financial decisions (i.e., product purchases) may have on others and/or the environment

Lesson 1: Considering Automation

Curriculum Expectations

Overall Expectation

1. assess the personal, social, and/or environmental impacts of a system, and evaluate improvements to a system and/or alternative ways of meeting the same needs

Specific Expectations

- 1.1 assess the social, economic, and environmental impacts of automating systems

Learning Goals

This lesson will take approximately 2 periods.

At the end of this lesson, students will be able to describe some of the financial, social, and/or environmental advantages and disadvantages of automating systems.

Sample Learning Goal:

I can give an example of a product and tell and tell some of the advantages and disadvantages of having that product crafted by hand or through automation.

Instructional Components and Context

Readiness

Prior to this lesson students should have:

- understanding of the term “system”

Terminology

efficient, system, automation, impact, intended and unintended impacts

Materials:

- Internet access
- Catalogues or flyers from large chain furniture retailers
- Optional but desirable: catalogues or flyers from local manufacturers of furniture
- Print or Internet access to manufacturers’ brochures of various manufactured and handcrafted products that might be of interest to students (e.g., mountain bikes, skateboards, jewelry, etc.)
- BLM 1: Is Technology a Friend or Foe?
- BLM 2: Technology: Friend or Foe (from *Think Literacy, Subject Specific Examples, Technology Gr. 7-9*, p. 27)
<http://www.edugains.ca/newsite/literacy2/thinkliteracy.html>
- BLM 3a: Automation P-M-I ... Is Automation a Friend or Foe? Page 1
- BLM 3b: Automation P-M-I ... Is Automation a Friend or Foe? Page 2

Minds On	Connections
<p>Description: Technology Friend or Foe Partners, independent, whole class work</p> <ul style="list-style-type: none"> • Tell students you’re going to ask them a question, but you want no responses for 30 seconds – they need 30 seconds of think time. • Ask students “What does the word ‘technology’ mean to you?” • After 30 seconds, give them one minute to discuss with an elbow partner (i.e., someone sitting near their elbow) • Ask students to discuss whether they see technology as a friend or a foe. • Hand out BLM 1 and ask students to make jot notes to capture the discussion they just had. • Once they have had a few minutes to work on their own ask them to share thoughts with a partner. • Hand out BLM 2 Technology Friend or Foe? And again, ask them to work alone. Have them read the handout and add points to either side of their chart. • After a few minutes, let them discuss with a group and then share out with the class. • <u>Optional</u> (requires BLM1 to be copied on each side of a page): Ask student to rewrite their chart on the other side of the page, but this time organize it so: <ul style="list-style-type: none"> ○ similar thoughts are grouped together ○ headings are placed above each cluster of thoughts 	<p>A^{for}L Assessment for learning: Teachers use the Minds On portion of the lesson to assess students’ prior knowledge and misconceptions. This helps inform instruction for the Action and Consolidation phases. No formal evaluation required.</p> <p> Some students may have difficulty switching from one side of the page to the other; these students may benefit from being able to place their charts side by side.</p> <p>If possible, provide bilingual support for ELL students (another student, online translation software)</p>
Action!	
<p>Description: Product research – handcrafted vs. automated Small group work:</p> <ul style="list-style-type: none"> • Let students know that today they will be looking at one aspect of technology – automation. • Discuss with the class what the term automation means to them. Then provide students with a dictionary definition: e.g., from Webster’s New Collegiate Dictionary: “...operation of an apparatus, process, or system by mechanical or electronic devices that take the place of human organs of observation, effort, and decision”. Clarify with them what this means using student-friendly language. 	<p> Use pictures of something being made by hand and something being made on an assembly line to help students understand meaning of automation.</p>

Action! (continued)

- Ask what they think might be some of the advantages and disadvantages of buying something handcrafted or custom made versus similar items manufactured with greater automation
- Encourage students to think of aspects such as:
 - cost of items (i.e., personal financial considerations)
 - financial considerations of others (e.g., jobs lost or created)
 - quality of items
 - transportation distance / delivery time
 - warranty / longevity of item
 - environmental factors
- Have them briefly talk with an elbow partner and then share thoughts with another pair.
- Handout BLM 3a and read it over with students so that they understand what they will be researching.
- Inform students that they are going to select an item of their choice and compare those items crafted by hand to similar items mass manufactured through automation. Emphasize that by similar, you mean similar in size, function, purpose. Price will be looked at during the comparison.
- Suggest that they should think of examples of something they might buy at a chain or local store and then see if they can find a company that produces similar items by hand.
- Select an example (e.g., furniture) to lead students through a shared or guided discussion using a “think aloud” process so they can see the kinds of descriptors they might look for (cost, environmental claims if any, references to where or how things are made) as they peruse the websites.
- Provide students with Internet access and flyers, brochures, or catalogues from various local businesses producing handcrafted items. Some online sources are included below. Students will also want to be free to search items of personal interest.
- Some suggestions for students might be:
 - household furniture (e.g., dining table)
 - clothing (e.g., suits, jackets, shirts, dresses)
 - bicycles
 - skateboards or snowboards
 - jewelry

Students should research different products (furniture, skateboards, clothing, bicycles) that are handmade or products made through automation/mass production.



Activate prior knowledge by asking them where they've seen things being produced in these ways.



Many students will benefit from the strategy of working through an example as a think aloud. Use chart paper to show how to fill in the chart.

Use of visuals (pictures, actual objects) and gestures will be useful to many early stage ELL students. These students will also benefit from decreased demands in completion of the chart.

Students might benefit from introducing terms they may come across in their research (e.g., handmade, hand-crafted, made by hand, custom made, etc.)

Action! (continued)	
<p>Note to Teachers:</p> <ul style="list-style-type: none"> Students should be encouraged to investigate items that are interesting to them. 	 DI Some students may need assistance navigating the various websites to gather information. Student pairs or groups of 3 may be helpful.
Consolidation	
<p>Description: Completion of BLM 3b <u>Individual</u></p> <ul style="list-style-type: none"> Ask students to read over BLM 3b on their own and ask any questions of clarification. Co-construct success criteria with students, based on their work with BLM 3a and record them on chart paper and post in the classroom. Students complete BLM 3b on their own and submit it for assessment <p>Note to Teachers: The final choice, “Do you even think Question #1 above is a fair question?” on BLM 3b is provided because many may not view automation as an either/or proposition, and may wish to discuss both sides of the argument.</p>	<p>AOL Assessment as learning Co-creating success criteria with students often give them a clearer picture of what is required.</p> <p>AOL Assessment of learning: Completion of BLM 3</p>  Some students may benefit from the use of sentence frames and simpler language to better demonstrate their learning (e.g., I think automation is mostly ___(good / bad) because _____.

BLM 1: Technology ... Is Technology a Friend or Foe?

Record your thoughts in the chart below. Try to group similar thoughts together.

Friend	Foe

adapted from *Think Literacy: Subject Specific Examples Technology, Grades 7-9*

Technology: Friend or Foe?

*Michael Hacker and Robert Barden are the authors of the book, *Living with Technology*. Together they have written about the need for people to understand all aspects of technology today. Their writing makes the reader stop and think. After reading the rest of this article you will be asked an important question. Your answer could prove to be very important to your future. Continue reading to discover the question.*

In early times when the early pioneers were settling Canada, it took months for people to travel across the country. Horse and buggy was a slow and uncomfortable means of travel. News, which took weeks or months to arrive at the general store, was often out of date before reaching its destination. Most products found in pioneer homes were made by hand, by pioneers themselves. Today things are quite different.



Airplanes take us from coast to coast in a few hours, the Internet and television informs us of news as it is happening and most everything we need for our homes is produced through manufacturing technology. Technology has made many improvements to our standard of living.

There is another side to technology; however, that we sometimes fail to see. For example, each year, vehicles designed to save time, claim hundreds and thousands of victims as large trucks share highways with passenger buses and family cars. In 1986 seven astronauts were killed when the Space Shuttle Challenger blew up only minutes after it left the launch pad, then Columbia disintegrated in the sky as it was landing in 2002. Low-level radiation leaks from modern conveniences, such as, microwaves and cell phones are believed to be putting many people at risk for cancer.



Some people feel that technology is developing too quickly. Other people say technology leads to too many disasters. Air pollution, noise pollution, crowded highways, and diseases like cancer can be blamed on technology.

Is technology our friend or our foe? Is it good or is it evil? Would you really want to live like the pioneers for the rest of your life? Is it possible to slow down the progress of technology? What changes will you see in your future because of technology? These are all important questions to think about when we ask ourselves the question, "Is technology our friend or our foe?" What do you think?



from Think Literacy: Subject Specific Examples Technology, Grades 7-9, p. 27

BLM 3a: Automation P-M-I ... Is Automation a Friend or Foe? Page 1

Instructions:

1. Identify the item or product you would like to research.
2. Look for as much information as you can find for your object. Use catalogues, flyers, online information
3. Record your findings. Complete as many areas as you can using the resources available.
4. You may have to look at items that are similar to yours if you can't find all the information about your specific product.

Product: _____

Handcrafted or custom-made products	Products made through automation / mass production
Retailer or store:	Retailer or store:
Price range:	Price range:
Claims about quality (if any):	Claims about quality (if any):
Warranty:	Warranty:
Availability/delivery time:	Availability/delivery time:
Environmental claims:	Environmental claims:
Financial implications to others (e.g., jobs)	Financial implications to others (e.g., jobs)
Other notes, thoughts, questions of interest to you:	Other notes, thoughts, questions of interest to you:

BLM 3b: Automation P-M-I ... Is Automation a Friend or Foe? Page 2

Record some of the main points you heard during the presentations of others.

	Handcrafted or custom-made products	Products made through automation / mass production
Plus (advantages)		
Minus (disadvantages)		
Interesting (I'm not sure if the information is a plus or a minus, but it is interesting)		

You have listened to class discussions, researched production methods, and considered multiple viewpoints. Now answer **one** of the following questions:

1. If you had to make a choice, would you say that automation is more a friend or a foe?
OR
2. Do you even think Question #1 above is a fair question?

Justify your answer by:

- summarizing what you feel are the advantages and disadvantages of automation
- showing that you have considered financial, social, and environmental aspects in your answer

You may use additional paper if necessary.