Module 1:
What Does It Mean?
An Introduction to *Inventions, Innovations, and Discoveries*

In Module 1: What Does It Mean? An Introduction to *Inventions, Innovations, and Discoveries* students participate in learning experiences (LEs) in which they are introduced to the concepts of inventions, innovations, and discoveries. They explore the purpose of inventions, innovations, and discoveries and how they affect everyday life.

The five LEs that make up Module 1: What Does It Mean? An Introduction to *Inventions, Innovations, and Discoveries* are described below.

LE Title	Estimated Time	Overview
Mod.1.1: What on Earth?	30 minutes, weekly	Students infer and predict the purpose of an unfamiliar object through observation. This learning experience helps students to activate interest in inventions, develop questioning skills, and form conclusions based on evidence. **Note:** Mod.1.1: What on Earth? can be revisited as an ongoing learning experience (OLE) throughout this *Inventions, Innovations, and Discoveries* interdisciplinary unit.
Mod.1.2: What Do I Know?	120 minutes	Students discuss what they already know about inventions, innovations, and discoveries. As they discuss the Overview of the *Inventions, Innovations, and Discoveries* interdisciplinary unit in which they will participate over the next few weeks, they note questions they wish to have answered and points of interest they wish to pursue.
Mod.1.3a: Back to the Future: A Timeline of Discoveries	180 minutes	Students explore the concept of "discovery." They prepare a Timeline of Discoveries that will help them identify and understand discoveries and place them in a social and historical perspective for Canada and the world. Students learn how to create a bibliography. They make an oral presentation about their chosen discovery.
Mod.1.3b: Why Do We Invent?	120 minutes	Students explore the concept of "inventions." Through investigation, students observe that an invention is the result of trying to meet a need that might make life easier or more pleasant. They write a paragraph explaining their choice for "the world's greatest invention." **Note:** Mod.1.3b: Why Do We Invent? may be revisited periodically during the *Inventions, Innovations, and Discoveries* interdisciplinary unit, as students identify more inventions.
Mod. 1.3c: Then and Now: Advances in Computer Technology	180 minutes	Students explore the concept of "innovation." They investigate the invention of the computer, from the first mainframe to the latest wireless palm computer, and note the changes and improvements (innovations) that have been made to that invention over time.

What on Earth? **Mod.1.1**

TIME
30 minutes, weekly

OVERVIEW
Students infer and predict the purpose of an unfamiliar object through observation. This learning experience helps students to activate interest in inventions, develop questioning skills, and form conclusions based on evidence.

Note: Mod.1.1: What on Earth? can be revisited as an ongoing learning experience (OLE) throughout this *Inventions, Innovations, and Discoveries* interdisciplinary unit.

LEARNING OUTCOMES
Through this learning experience (LE), students will achieve specific learning outcomes (SLOs) in various subject areas. Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified.

English Language Arts
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:
- 1.1.1 *Express Ideas* — Engage in exploratory communication to share personal responses, make predictions, and discover own interpretations.
- 1.1.2 *Consider Others' Ideas* — Select from others' ideas and observations to develop thinking and understanding.
- 1.2.1 *Develop Understanding* — Reflect on prior knowledge and experiences to arrive at new understanding.
- 1.2.2 *Explain Opinions* — Explain personal viewpoints in clear and meaningful ways and revise previous understanding.
- 1.2.4 *Extend Understanding* — Appraise ideas for clarity and ask extending questions; select from others' experiences and ideas to extend ways of knowing the world.
- 5.2.1 *Cooperate with Others* — Assist group members to maintain focus and complete tasks; identify and solve group process issues.
- 5.2.2 *Work in Groups* — Select and assume roles to assist in the achievement of group goals; engage in ongoing feedback.

Science
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:
- SLOs related to Scientific Inquiry or the Design Process in Cluster 0: Overall Skills and Attitudes.

ICT LITERACY SKILLS AND COMPETENCIES
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which skills and competencies students may achieve, in addition to those identified below:
- basic operating skills
- communicating electronically
- ethical use of technologies

- inquiry using electronic sources
- web page authoring

SUGGESTED LEARNING RESOURCES

Software

- email
- web page authoring

Print

- Appendix C: Index of Teaching and Learning Strategies and Tools
- Manitoba Education and Training. *Success for All Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools.* Winnipeg, MB: Manitoba Education and Training, 1996. (See Exit Slips, 6.60.)

BLMs

- BLM Mod.1.1#1: What on Earth?
- BLM Mod.1.1#2: Group-Participation Checklist

Materials

- variety of unfamiliar objects
- digital camera
- digital microscope

SUGGESTIONS FOR INSTRUCTION

Preparation and Set-up

- Bring to class a variety of objects that will likely be unfamiliar to students.
- Alternatively, students could bring a variety of unfamiliar objects. (Hint: They could ask their grandparents to share something from their kitchen or tool shed.) Advise students not to disclose the purpose of their object to the rest of the class.
- Display each object for at least one day prior to inferring its purpose. Allow students time to speculate about the purpose of the object.

Activating Strategies

- An inference is a conclusion drawn from observation. Introduce the process of inferring by brainstorming with students for common occurrences around them.
  Examples: Observation: There are puddles on the playground.
  Conclusion: It probably rained.
  Observation: The teacher gives me a stern look.
  Conclusion: I probably did something I was not supposed to do.
- Point out that several inferences can sometimes be made from a single observation.
  Examples: Observation: The book from my bag is wet.
  Conclusions: My lunch drink spilled.
  My bag is sitting in a puddle.
  My bag was not zipped up when I walked in the rain.
- Introduce the use of the five senses to validate an observation, draw a conclusion, and make a prediction. Students brainstorm occurrences when their senses can help in making an observation and drawing a conclusion.
  Examples: Observation: My wet book smells of apple juice.
  Conclusion: It must have been my drink that spilled.

Observation: My wet book feels sticky.
Conclusion: It must be juice and not water.

Acquiring Strategies

- Select and show one of the unfamiliar objects. Write down the questions that students brainstorm, as well as their observations.
  Examples: What is it made of? It is metal and wood.
  Why is it this shape? It reminds me of a horseshoe.
  What is this knob used for? It looks like a handle.
  Why is it rusty / sharp / oily? Maybe it is used in water.
  How does it work? It looks like this part turns.
  Who might have used it? It looks like a kitchen gadget.
- Based on the recorded questions and observations, students take turns making inferences.
  Examples: It has oil on it; therefore, it probably needs to turn smoothly.
  It has slots, so you probably insert another piece in there.
  These grooves probably make it turn or help it to attach to another piece.
- Using an Exit Slip, students write what they conclude the object must be and explain their prediction.
  Examples: I think it is a woodworking tool because it has a sharp edge that could be used to chip wood. I have found a wood chip in a crack and the rounded knob on the tool looks like you could hammer on it to drive it through the wood.
- Share some Exit Slips with the class and discuss the suggested uses of the object, the validity of the conclusions, and the astuteness and accuracy of the observations. Discuss how students could have improved their inferences and their predictions.
- Tell students what the object really is and, if possible, show them how it works.

Applying Strategies

- Once a week, in collaborative groups, students investigate an unfamiliar object.
- Students use BLM Mod.1.1#1: What on Earth? to record their observations.
- Allow each group of students to ask the owner of the object two questions that might help them to predict the purpose of the object. Each collaborative group creates and decides on questions that will yield the most information.

Variations/Extensions

- When students have learned the use of a digital camera (see ICT.7: Caught in Action) and have created a web page for the class (see ICT.11: Make It: Creating an Effective Web Page), use the camera to take photographs of the object at several angles. Post these pictures on the class website. Add a Mail-to-Link and invite email responses from key pals or classes at a distance. Students take turns answering email messages that make predictions.
- Use a digital microscope to take a close-up photograph of a familiar object. Take different shots further and further away, at the same angle. Use these shots as progressive clues to assist students in identifying the object.

SUGGESTIONS FOR ASSESSMENT

- Read the Exit Slips to assess whether students understand the process of inferring and predicting.
- Read student work recorded on BLM Mod.1.1#1: What on Earth? Can students observe obvious details in objects? Do they make appropriate inferences? Can they draw conclusions and make predictions from their inferences?

- Observe group work using a checklist such as BLM Mod.1.1#2: Group-Participation Checklist.

CONNECTION TO **INVENTION CONVENTION**

- Students start to think differently when they learn to make accurate and detailed observations, draw inferences from their observations, and make predictions from their inferences. This LE helps them to consider different aspects, perspectives, and points of view. They also learn to work as a team.

BLM Mod.1.1#1: What on Earth?

Name _____ Date _____

What I See (My Observations)	**What I Think It Means** (My Inferences)
What I Conclude, Based on My Observations (My Predictions)	

BLM Mod.1.1#2: Group-Participation Checklist

Project _____ Date _____

Participation in Group Work	**Student Names**											
The student												
• demonstrates attentiveness												
• shows appreciation for others' ideas												
• recalls relevant information												
• clarifies ideas												
• provides feedback												
• asks relevant questions												
• takes turns												
• contributes ideas												
• describes concepts												
• includes everyone												
• paraphrases												
• elaborates												
• criticizes ideas, not people												
• disagrees politely												

Group-Participation Checklist: Adapted from *Grades 5 to 8 English Language Arts: A Foundation for Implementation* (Manitoba Education and Training BLM-55).

What Do I Know? **Mod.1.2**

TIME
120 minutes

OVERVIEW
Students discuss what they already know about inventions, innovations, and discoveries. As they discuss the Overview of the *Inventions, Innovations, Discoveries* interdisciplinary unit in which they will participate over the next few weeks, they note questions they wish to have answered and points of interest they wish to pursue.

LEARNING OUTCOMES
Through this learning experience (LE), students will achieve specific learning outcomes (SLOs) in various subject areas. Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified.

English Language Arts
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:
- 2.1.1 *Prior Knowledge* — Seek connections between previous experiences, prior knowledge, and a variety of texts.
- 3.1.1 *Use Personal Knowledge* — Summarize and focus personal knowledge of a topic to determine information needs.
- 3.1.2 A*sk Questions* — Formulate relevant questions to focus information needs for an inquiry.
- 3.2.1 *Identify Personal and Peer Knowledge* — Recall, record, and organize personal and peer knowledge of a topic for inquiry or research.
- 3.3.2 *Record Information* — Make notes on a topic, combining information from more than one source; reference sources appropriately.
- 3.3.4 *Develop New Understanding* — Relate gathered information to prior knowledge to reach conclusions or develop points of view; establish goals for developing further inquiry or research skills.
- 5.2.1 *Cooperate with Others* — Assist group members to maintain focus and complete tasks; identify and solve group process issues.
- 5.2.2 *Work in Groups* — Select and assume roles to assist in the achievement of group goals; engage in ongoing feedback.

Science
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:
- SLOs related to Scientific Inquiry or the Design Process in Cluster 0: Overall Skills and Attitudes.

ICT LITERACY SKILLS AND COMPETENCIES
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which skills and competencies students may achieve, in addition to those identified below:
- basic operating skills
- inquiry using electronic sources

- concept mapping

SUGGESTED LEARNING RESOURCES

Software

- concept mapping

Internet

- IMYM Links Database: <http://www.edu.gov.mb.ca/ks4/tech/imym/resources/links.html>

CD-ROM

- electronic encyclopedia

Videos

- video about inventions
- Invention Convention and other videos made by students in the previous year's *Inventions, Innovations, and Discoveries* interdisciplinary unit

Print

- Selected Bibliography
- Appendix C: Index of Teaching and Learning Strategies and Tools
- Manitoba Education and Training. *Success for All Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools.* Winnipeg, MB: Manitoba Education and Training, 1996. (See Anticipation Guides, 6.25, 6.98; Exit Slips, 6.60; and KWL, 6.20.)

BLMs

- BLM Mod.1.2#1: Overview of *Inventions, Innovations, and Discoveries*
- BLM Mod.1.2#2: Solving Problems in Group Work

Materials

- magazine and newspaper articles about inventions, innovations, and discoveries

SUGGESTIONS FOR INSTRUCTION

Preparation and Set-up

- Set up collaborative learning groups (see OLE.6: Collaborative Learning).
- Assemble materials from the resources suggested in Selected Bibliography or from school/community libraries.
- Start collecting articles about inventions, innovations, and discoveries from newspapers and magazines several weeks ahead of time and/or ask students to do the same. Brainstorm keywords students might look for in headlines or sections in an issue of a newspaper or magazine to help them identify such articles (e.g., in the Science and Technology section).
- Place Bookmarks or Favourites of appropriate websites on the class computers, or ask students to do so. These can also be placed as links on the class website.
- Prepare an Anticipation Guide for the chosen video, modelled on the Anticipation Guide in *Success for All Learners* (6.98).
- Arrange to have an Elder or community member talk to the whole class or to small groups of students about inventions, innovations, and discoveries.
- Create a PowerPoint presentation to introduce the *Inventions, Innovations, and Discoveries* interdisciplinary unit to the class. (This presentation is also used to activate knowledge in ICT.8: Make Your Point.)

Activating Strategies

- Introduce students to the variety of print and electronic resources assembled for this interdisciplinary unit and explain what they can expect to find. Students browse the resources and bookmarked websites at times set aside for that purpose. They record in their journals (see OLE.8: Reflection Journal) a resource that caught their attention, and explain why.
- Show a movie or an appropriate segment of a movie about inventions. Students use an Anticipation Guide to take notes.
- Students listen to a presentation on inventions, innovations, or discoveries by an Elder or community member. They use an Anticipation Guide to take notes.
- Introduce the *Inventions, Innovations, and Discoveries* interdisciplinary unit in general terms. (It will be explained in more detail later.)
- Take notes as students brainstorm what they think they already know about discoveries, innovations, inventions, and inventors as a whole group. Use a KWL (Know, Want to know, Learned) format on chart paper or record suggestions on the class computer and projection system.

Acquiring Strategies

- Print a copy of the brainstormed list for each of the collaborative groups, or post the KWL chart on the classroom wall.
- Each group organizes the list into categories they establish and name, using concept-mapping software (e.g., inventors, electrical inventions, inventions for kids) (see ICT.6: Inspired).
- As a class, compare the categories that the groups created. Discuss the rationale they used to establish categories, focusing on appropriateness, originality, and effectiveness of the categories.
- Explain how to complete a bibliography. Instruct students to record sources of information throughout this unit in their bibliography.
- Distribute copies of BLM Mod.1.2#1: Overview of *Inventions, Innovations, and Discoveries*, explaining each component. Students place the BLM in their Personal OLE Binder.

Applying Strategies

- Students complete Exit Slips, noting three things they want to find out about inventions, innovations, or discoveries, and two questions they have about this interdisciplinary unit.

SUGGESTIONS FOR ASSESSMENT

- Read students' Exit Slips and note frequently asked questions (FAQs). Answer these in class.
- Students assess their beginning skills at group work using BLM Mod.1.2#2: Solving Problems in Group Work.
- Read students' self-assessment and confer with each group about their group-work observations and the possible impact of their solutions.

***CONNECTION TO* INVENTION CONVENTION**

- Reviewing the overview of the whole interdisciplinary unit leads students through the steps from the beginning to the end. They know what to expect.

BLM Mod.1.2#1: Overview of *Inventions, Innovations, and Discoveries*

Name _____ Date _____

Module 1:
What Does It Mean?
An Introduction to *Inventions, Innovations, and Discoveries*

Learning Experience (LE) Title	LE Overview
Mod.1.1: What on Earth?	Infer and predict the purpose of an unfamiliar object through observation.
Mod.1.2: What Do I Know?	Discuss what you already know about inventions, innovations, and discoveries. Note questions you wish to have answered and points of interest you wish to pursue.
Mod.1.3a: Back to the Future: A Timeline of Discoveries	Explore the concept of "discovery." Prepare a timeline to identify and understand discoveries and place them in a social and historical perspective for Canada and the world. Learn how to create a bibliography. Make an oral presentation about your chosen discovery.
Mod.1.3b: Why Do We Invent?	Explore the concept of "inventions." Through investigation, observe that an invention is the result of trying to meet a need that might make our lives easier or more pleasant. Write a paragraph explaining your choice for "the world's greatest invention."
Mod.1.3c: Then and Now: Advances in Computer Technology	Explore the concept of "innovation." Investigate the invention of the computer, from the first mainframe to the latest wireless palm computer, and note the changes and improvements (innovations) that have been made to that invention over time.

Module 2:
Explain That Again: A Further Investigation

LE Title	LE Overview
Mod.2.1: Extra! Extra! Read All about It!	Listen to or read stories about inventions that have affected your life in one way or another. These stories trace the history of an invention from its inception to its current application. Analyze one story and write a newspaper article publicizing the invention profiled in the story.
Mod.2.2: Biography of an Inventor or a Scientist	Research an inventor or a scientist and write a short biography of this person.
Mod.2.3: Rube Goldberg	Discover that the American cartoonist Rube Goldberg (1883-1970) became famous for developing sketches of oddball inventions that came to be called "Rube Goldberg Machines." Invent and draw your own Rube Goldberg machine and write descriptions that model how Rube Goldberg described his "inventions."
Mod.2.4: Chindogu: Useless Inventions	Chindogu is a Japanese word meaning "useless invention." Use communication skills to persuade a "consumer" of the advantages and merits of purchasing a useless invention. This can be accomplished through a written advertisement, a video commercial, a poster, or some other appropriate means.
Mod.2.5: Tally-Ho	Make a tally of the electrical and non-electrical inventions you use in your own home. Use this list to complete a double-bar graph on a spreadsheet.
Mod.2.6: Customer Service Department	Learn to design and conduct a survey to verify the needs and complaints of a selected group of people, which could be satisfied by creating an invention or by improving on one (innovation).

(continued)

Module 3:
Explore Electricity: The Backbone of Modern Inventions

LE Title	LE Overview
Mod.3.1: Static Electricity	Investigate static electricity in common objects. Construct an electroscope to test a variety of objects for static electricity. Write a definition of static electricity using appropriate vocabulary.
Mod.3.2: Current Electricity	Explore current electricity. Through experimentation, learn how simple series and simple parallel circuits work. Write a definition for an electrical circuit.
Mod.3.3: Electrical Circuits	Improve your electrical circuits and discover what changes make a light bulb brighter. Investigate and invent useful electrical circuits, including switches.
Mod.3.4: Electromagnetism	Explore electromagnetism by building an electromagnet. Explore motors and generators by constructing a motor or a generator that can be used to power a simple device you would find useful in your daily life.
Mod.3.5: Awareness of Electrical Energy Consumption	Describe factors that affect the consumption of electrical energy to raise your awareness of energy use. Outline an action plan to reduce energy consumption and promote your plan. Describe ways in which electricity has an impact on your daily life.
Mod.3.6: Safety with Electricity	Design a poster or a web page to promote safety with electricity.

Module 4:
Invention Convention: The Student As Inventor

LE Title	LE Overview
Mod.4.1: Design Your Own Invention OR Build a Better . . .	Design and build your own invention, based on a "need" you have identified that could fulfill a specific "want." OR Improve on a current invention (innovation).
Mod.4.2: Design a Logo/ Business Card	Use graphics software to design you own logo and create a catchphrase to promote your invention. Create a business card that incorporates your logo and catchphrase.
Mod.4.3: Promotion	Review a variety of advertising strategies used to promote products and services. Rotate through learning centres to create a promotional poster, a commercial, a pamphlet, a jingle, and a multimedia presentation or website to promote your invention.
Mod.4.4: Showtime	Plan, promote, set up, and hold an Invention Convention in which you showcase your invention.
Mod. 4.5: Mission Accomplished: A Reflection	Reflect upon the Invention Convention. Note what worked well and what could be improved upon in general for the event. Reflect on your own display, on the feedback you received for your invention, and on the suggestions that were made.

BLM Mod.1.2#2: Solving Problems in Group Work

Group Members _____ _____ _____

1. What problems did your group encounter?

   _____

   Why?

   _____

2. Brainstorm some solutions:

   ☺ _____

   ☺ _____

   ☺ _____

3. For each solution, ask yourself:
   - Will it solve the problem?
   - Will people in the group be comfortable with it?
   - Is it fair?

   _____

4. Choose a solution.

   _____

5. What help will you need to try your solution?

   _____

6. Make a plan and try your solution.

   Plan:

   _____

7. Did it work? Explain.

   _____

8. If not, go back to #4 and try again.

   _____

Solving Problems in Group Work: Reproduced from *Grades 5 to 8 English Language Arts: A Foundation for Implementation* (Manitoba Education and Training BLM-35).

Back to the Future: A Timeline of Discoveries Mod.1.3a

TIME
180 minutes

OVERVIEW
Students explore the concept of "discovery." They prepare a Timeline of Discoveries that will help them identify and understand discoveries and place them in a social and historical perspective for Canada and the world. Students learn how to create a bibliography. They make an oral presentation about their chosen discovery.

LEARNING OUTCOMES
Through this learning experience (LE), students will achieve specific learning outcomes (SLOs) in various subject areas. Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified.

English Language Arts
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:

- 2.1.1 *Prior Knowledge* — Seek connections between previous experiences, prior knowledge, and a variety of texts.
- 3.2.4 *Access Information* — Use a variety of tools [including bibliographies, thesauri, and technology] to access information and ideas; use visual and auditory cues [such as captions, intonation, staging…] to identify relevant information.
- 3.2.5 *Make Sense of Information* — Use organizational patterns of oral, visual, and written texts [including main ideas and supporting details, explanation, comparison and contrast, cause and effect, and sequence] to construct meaning; skim, scan, and read closely to gather information.
- 3.3.1 *Organize Information* — Organize information and ideas using a variety of strategies and techniques [such as comparing and contrasting, classifying and sorting according to subtopics, sequences, order of priority or importance...].
- 3.3.2 *Record Information* — Make notes on a topic, combining information from more than one source; reference sources appropriately.
- 4.1.1 *Generate Ideas* — Focus a topic for oral, written, and visual texts integrating ideas from experiences and a variety of other sources.
- 4.2.2 *Revise Content* — Revise to eliminate unnecessary information.
- 4.4.1 *Share Ideas and Information* — Share information on a topic with class members in a planned and focused group session using a variety of strategies [such as interactive dialogues, demonstrations, dramatizations, audio-visual and artistic representations…].
- 4.4.2 *Effective Oral Communication* — Use appropriate volume, phrasing, intonation, non-verbal cues [such as body language, facial expression...], and presentation space to enhance communication.
- 4.4.3 *Attentive Listening and Viewing* — Demonstrate critical listening and viewing skills and strategies [such as recognizing main idea and details, identifying inference...] and show respect for presenter(s) through appropriate audience behaviours [such as giving non-verbal encouragement, responding to emotional aspects of the presentation...].

Science
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:
- SLOs related to Scientific Inquiry or the Design Process in Cluster 0: Overall Skills and Attitudes.

ICT LITERACY SKILLS AND COMPETENCIES
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which skills and competencies students may achieve, in addition to those identified below:
- basic operating skills
- ethical use of technologies
- publishing electronically
- spreadsheet analysis

SUGGESTED LEARNING RESOURCES
Software
- web page authoring
- spreadsheet

Internet
- IMYM Links Database: <http://www.edu.gov.mb.ca/ks4/tech/imym/resources/links.html>

CD-ROM
- electronic encyclopedia

Print
- Selected Bibliography
- Appendix C: Index of Teaching and Learning Strategies and Tools
- Manitoba Education and Training. *Success for All Learners: A Handbook on Differentiating Instruction: A Resource for Kindergarten to Senior 4 Schools.* Winnipeg, MB: Manitoba Education and Training, 1996. (See Anticipation Guides, 6.25, 6.98.)

BLMs
- BLM Mod.1.3a#1: Sample Timeline of Discoveries
- BLM Mod.1.3a#2: Peer Assessment of Oral Presentation: Terrific/Plus
- BLM Mod.1.3a#3: Active Response Form
- BLM Mod.1.3a#4: Recording Bibliographic Notes
- BLM Mod.1.3a#5: Bibliography Checklist
- BLM Mod.1.3a#6: The 5Ws + H of Discoveries

TBLMs
- TBLM Mod.1.3a#1: Discovery Examples
- TBLM Mod.1.3a#2: Making a Bibliography

Materials
- display materials: chart paper, markers, and so on
- newspaper articles about discoveries

SUGGESTIONS FOR INSTRUCTION

Preparation and Set-up

- Make a large class Timeline of Discoveries chart, following the format suggested in BLM Mod.1.3a#1: Sample Timeline of Discoveries. It will later be posted in an appropriate location in the classroom for the duration of this interdisciplinary unit and updated as needed. Students may also have their own personal timeline chart.
- Explore websites (such as those identified on the IMYM Links Database) to find resources and suggestions for doing a research project.

Activating Strategies

- **Note:** Teach concepts such as discoveries, inventions, and innovations separately to facilitate clearer understanding. Start with discoveries and proceed in a similar fashion on consecutive days for inventions and innovations.
- Students look up the meaning of "discovery" in a dictionary.
- Use TBLM Mod.1.3a#1: Discovery Examples to help students identify and classify some discoveries before they begin their research.
- Students access classroom resources assembled for this interdisciplinary unit to identify discoveries. It may be easier to concentrate on a specific period such as the twentieth century, or post-World War Two. Students record their findings at the appropriate time frame on the class Timeline of Discoveries chart.
- Discuss with students why people in general, or scientists in particular, seek to discover. Can discoveries be accidental?

Acquiring Strategies

- Each student chooses a discovery from the Timeline of Discoveries chart to research.
- Students access print and electronic resources to find information about their chosen discovery, using BLM Mod.1.3a#6: The 5Ws + H of Discoveries to record notes. If possible, they peruse at least one print and one electronic resource and record their sources of information on a personal BLM Mod.1.3a#4: Recording Bibliographic Notes each time they find information in a resource.
- Confer regularly with students to provide feedback on content, to answer questions, and to discuss appropriate presentation formats.

Applying Strategies

- Students share their findings about their discovery with their classmates through oral presentations.
- Students add historical and social information to the class Timeline of Discoveries chart.
- Teach students how to organize their bibliographic notes of resources used to create their presentations and how to record them in the proper bibliographic format. (See TBLM Mod.1.3a#2: Making a Bibliography.) When they have completed the bibliography, they fill out BLM Mod.1.3a#5: Bibliography Checklist.

Variations/Extensions

- Discuss with students possible links between Canadian historical and social events and discoveries. Proceed by decade.
- Students listen to a presentation by an Elder or a member of their community. They use an Anticipation Guide to take notes. (See *Success for All Learners,* Anticipation Guide, 6.98.)
- Students create a Timeline of Discoveries made by First Peoples of North America.
- Instead of preparing an oral presentation, students write a report. They edit and improve it using teacher suggestions and investigative questions.

- Students post their reports on the class website.
- Instead of posting their research findings on a common class Timeline of Discoveries chart, groups of students arrange their research results in a spreadsheet format, which they print without cell lines.

SUGGESTIONS FOR ASSESSMENT

- Confer with students to assess their understanding of discoveries. Clarify information for the whole class based on questions students pose during the conferences.
- Students assess each other's oral presentations using BLM Mod.1.3a#2: Peer Assessment of Oral Presentation: Terrific/Plus.
- Read students' written reports. Provide feedback in the form of suggestions or investigative questions. Students use the answers to these questions to improve on their written reports.
- Students use BLM Mod.1.3a#3: Active Response Form to reflect on their learning and listening skills during presentations.
- Check students' bibliographies and their completion of BLM Mod.1.3a#5: Bibliography Checklist. Answer their questions and give feedback on the BLM.

CONNECTION TO INVENTION CONVENTION

- When researching discoveries that marked the twentieth century, students become aware of the trends or areas that are most significant.

BLM Mod.1.3a#1: Sample Timeline of Discoveries

Name _____ Date _____

Adapt this sample to any chronological period, or reorganize it using historical periods (e.g., First World War, the Depression).

	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
Discoveries										
Canadian Social and Historical Events										
World Events										
Other										

BLM Mod.1.3a#2: Peer Assessment of Oral Presentation: Terrific/Plus

Name _____ Date _____

Name of Presenter _____

Terrific
Describe what you liked about the student's presentation. 1. 2. 3.
Plus
Make one or two suggestions for improvement. 1. 2.

Peer Assessment of Oral Presentation: Terrific/Plus: Adapted from *Grades 5 to 8 English Language Arts: A Foundation for Implementation* (Manitoba Education and Training, Grade 6, 317).

BLM Mod.1.3a#3: Active Response Form

Name _____ Date _____

Presenter _____

Presentation Title _____

1. The most interesting thing I learned was
2. The best thing you did to keep my attention was
3. One thing I wondered about was
4. One suggestion you might try is

Signature _____

Active Response Form: Adapted from *Grades 5 to 8 English Language Arts: A Foundation for Implementation* (Manitoba Education and Training, Grade 6, 389).

BLM Mod.1.3a#4: Recording Bibliographic Notes

Name _____ Date _____

Book

1. Author(s) _____
   (Found on title page, not on cover.)

   Title _____
   (Found on title page.)

   Place of Publication _____
   (City and province/state found on title page or back of title page. Take first one if there is more than one.)

   Publishing Company _____
   (Found on title page.)

   Date of Publication _____
   (Found on title page or back of title page. Look for copyright © symbol.)

2. Author(s) _____

   Title _____

   Place of Publication _____

   Publishing Company _____

   Date of Publication _____

3. Author(s) _____

   Title _____

   Place of Publication _____

   Publishing Company _____

   Date of Publication _____

4. Author(s) _____

   Title _____

   Place of Publication _____

   Publishing Company _____

   Date of Publication _____

Personal Interview

Name of Interviewee _____

Type of Interview (e.g., telephone, personal, letter) _____

Subject of Interview _____

(continued)

Newspapers or Magazines

Author(s)_____

Title_____

Name of Newspaper or Magazine_____

Date _____ Page Number _____

Encyclopedia

Author(s) _____
(Usually found at end of article, if there is an author.)

Title of Article_____
(e.g., Bears; Saturn; Columbus, Christopher; Second World War)

Name of Encyclopedia _____

Place of Publication _____

Publishing Company _____

Date of Publication_____

Personal Email

Name of Sender _____

Date of Email _____

Subject of Email _____

Website (this is a student-adapted version)

1. Author(s)_____
   (May be found on the home page for the website.)

   Title of Article_____
   (Usually at top of page.)

   Name of Website Host_____
   (e.g., university, company, foundation, museum, school)

   Date _____ Date of Visit _____
   (Date website was first made, or updated.) (Date information was found on the site for a project.)

2. Author(s)_____

   Title of Article_____

   Name of Website Host_____

   Date _____ Date of Visit _____

BLM Mod.1.3a#5: Bibliography Checklist

Name _____ Date _____

Check whether the bibliographic information below is correct for each entry.

Bibliographic Information	Student ✓	Teacher ✓
1. Alphabetical order (by author's last name)		
2. All data present:		
• Author(s)		
• Title		
• Place of publication		
• Publisher		
• Date of publication		
Student Questions		
Teacher Comments		

BLM Mod.1.3a#6: The 5Ws + H of Discoveries

Name _____ Date _____

5Ws + H	Notes
1. **What** is this discovery? Describe it.	
2. **Who** is credited with the discovery?	
3. **When** was it discovered?	
4. **Where** was it discovered?	
5. **Why** is this discovery important?	
6. **How** was it discovered? Describe the circumstances.	

TBLM Mod.1.3a#1: Discovery Examples

Recent discoveries may not be easy for students to identify, yet newspapers and information magazines regularly mention discoveries and often feature significant ones.

Examples of Discoveries	
Types of Discoveries	**Examples**
Archaeological Discoveries	• tomb of King Tut (Egyptian pharaoh Tutankhamen) • dinosaur bones in Alberta or the Gobi Desert • bison bones from hunt near Ninette, Manitoba • First Nations, Inuit, and Métis sites • the temple of the queen of Sheba • the bones of Peking Man • Ice Man of the Alps • Bog Man of England
Medical Discoveries	• the gene for cystic fibrosis • penicillin • Aboriginal traditional medicines (e.g., willow bark as analgesic) • insulin • vaccines for a variety of diseases • the gene sequences in the human genome
Astronomical Discoveries	• a new planet (e.g., Pluto in 1930) • comets • asteroids • moons of planets • black holes • galaxies
Chemical Discoveries	• a new chemical compound • glue for self-adhesive note paper • natural gas in Leduc, Alberta • radioactivity • diamond deposits in northern Manitoba
Mathematical Discoveries	• the concept of zero was discovered separately by Babylonians, Mayas, and Hindus • modern algebra was based on theories of Évariste Galois • Pythagoras describes the relationships in right angle triangles
Other Discoveries	• new plant and animal life in the Amazon forest • new animal life in the deep ocean (e.g., a new species of shark off the coast of Columbia)

TBLM Mod.1.3a#2: Making a Bibliography

Overview

A **bibliography** is an alphabetically ordered list of print, electronic, and other media resources used to collect information during an inquiry or project. Grade 6 students are expected to provide complete bibliographies of resources, as indicated in SLO 3.3.2 of the Grade 6 English Language Arts curriculum:

3.3.2 *Record Information* — Make notes on a topic, combining information from more than one source; reference sources appropriately.

Suggestions

Students can set up a spreadsheet to record bibliographic information. The spreadsheet can be alphabetized electronically to facilitate creating the bibliography.

Many bibliographic formats are recognized and used widely to document research. The Modern Language Association (MLA) style is a commonly used style. Consider the following categories.

Book
Okuda, Michael, and Denise Okuda. *Star Trek Chronology: The History of the Future*. New York, NY: Pocket Books, 1993.

Newspaper Article
Di Rado, Alicia. "Trekking through College: Classes Explore Modern Society Using the World of Star Trek." *Los Angeles Times* 15 Mar. 1995: A3.

Magazine Article
Kunzig, Robert. "Antigravity in Pisa." *Discover* 21.8 (Aug. 2000): 72-79.

Encyclopedia Article
Sturgeon, Theodore. "Science Fiction." *The Encyclopedia Americana*. 1995.

Interview
Mercredi, Ovide. Telephone interview. 20 Jan. 2001.

Personal Email
Doer, Gary. "Being a Premier." Email by the author. 30 Sept. 2002.

Website
Boys, Penny. "The Official Rube Goldberg Web Site." 2001. Rube Goldberg Inc. <http://www.rube-goldberg.com/>. 25 Oct. 2004.

Refer to the IMYM Links Database for suggested resources.

Why Do We Invent? **Mod.1.3b**

TIME
120 minutes

OVERVIEW
Students explore the concept of "inventions." Through investigation, students observe that an invention is the result of trying to meet a need that might make life easier or more pleasant. They write a paragraph explaining their choice for "the world's greatest invention."

Note: Mod.1.3b: Why Do We Invent? may be revisited periodically during the *Inventions, Innovations, and Discoveries* interdisciplinary unit, as students identify more inventions.

LEARNING OUTCOMES
Through this learning experience (LE), students will achieve specific learning outcomes (SLOs) in various subject areas. Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified.

English Language Arts
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:

- 1.1.1 *Express Ideas* — Engage in exploratory communication to share personal responses, make predictions, and discover own interpretations.
- 1.1.2 *Consider Others' Ideas* — Select from others' ideas and observations to develop thinking and understanding.
- 1.2.1 *Develop Understanding* — Reflect on prior knowledge and experiences to arrive at new understanding.
- 1.2.4 *Extend Understanding* — Appraise ideas for clarity and ask extending questions; select from others' experiences and ideas to extend ways of knowing the world.
- 2.3.3 *Vocabulary* — Experiment with ambiguity in language [such as puns, jokes based on multiple meanings, poetry…] in a variety of contexts.
- 2.3.4 *Experiment with Language* — Alter words, forms, and sentence patterns to create new versions of texts for a variety of purposes [such as humour…]; explain ways in which figures of speech [such as similes, metaphors…] clarify and enhance meaning.
- 2.3.5 *Create Original Texts* — Create original texts [such as letters, short stories, media broadcasts, plays, poems, video presentations, Readers Theatre…] to communicate and demonstrate understanding of forms and techniques.
- 3.1.2 *Ask Questions* — Formulate relevant questions to focus information needs for an inquiry.

Science
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:

- SLOs related to Scientific Inquiry or the Design Process in Cluster 0: Overall Skills and Attitudes.

Social Studies
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:

- 6-KI-011 Describe daily life on a prairie homestead between 1890 and 1914.
  Examples: survey system, role of women, challenges facing early settlers, education...
- 6-VL-010 Appreciate the efforts of people in early Canada to overcome environmental hardships.
- 6-KE-056 Relate stories of the Depression and describe its impact on Canada.
  Examples: changes in agricultural practices, development of the social safety net, new political parties...
- 6-KE-057 Give examples of the impact of technological development on life in Canada from 1914 to 1945.
  Examples: electricity, telecommunication, transportation, medicine, industrialization...
- 6-KE-058 Give examples of ways in which industry and technology have changed life in Canada since 1945.
  Examples: urbanization, transportation, communication, education...
- 6-KE-059 Give examples of inventions and technologies created in Canada.
  Examples: kayaks, snowmobiles, Canadarm, insulin, canola...
- 6-KL-026 Describe the influence of the natural environment on life in Canada.
- 6-KL-026A Describe the influence of the land on their First Nation, Inuit, or Métis identity.
  Examples: values, beliefs, traditions, customs, art, clothing...

ICT LITERACY SKILLS AND COMPETENCIES

Consider the intent of this LE and your choice of instructional and assessment strategies to determine which skills and competencies students may achieve, in addition to those identified below:

- basic operating skills
- inquiry using electronic sources
- word processing

SUGGESTED LEARNING RESOURCES

Software

- word processor

Internet

- IMYM Links Database: <http://www.edu.gov.mb.ca/ks4/tech/imym/resources/links.html>
- Search the Internet using the terms “sayings” and “idioms.”

CD-ROM

- electronic encyclopedia

Video

- video about inventions

Print

- survival stories (see Fiction section of Selected Bibliography)
- Appendix C: Index of Teaching and Learning Strategies and Tools

BLMs

- BLM OLE.4#6: Reading Circle Response Log
- BLM Mod.1.3a#1: Sample Timeline of Discoveries
- BLM Mod.1.3b#1: Why Do We Invent?

- BLM Mod.1.3b#2: Categorizing Inventions

SUGGESTIONS FOR INSTRUCTION

Preparation and Set-up

- Place Bookmarks or Favourites of appropriate websites from the IMYM Links Database on the class computers, or place them as links on the class website.
- It may be useful to proceed with OLE.4: Reading Circles, and study a survival story such as *Hatchet* by Gary Paulson (see Selected Bibliography).

Activating Strategies

- **Note:** Teach concepts such as discoveries, inventions, and innovations separately to facilitate clearer understanding. Start with discoveries and proceed in a similar fashion on consecutive days for inventions and innovations.
- Students look up the meaning of "invention" in the dictionary. Observe whether students can describe how "invention" is different from "discovery."
- Show a movie or a segment of a movie about inventing (e.g., classics such as *Swiss Family Robinson* or *Robinson Crusoe* and more recent movies such as *Flubber*).
- Find whether and when a TV show such as *Junkyard Wars* or *Red Green* is scheduled.
  - The participants in *Junkyard Wars* are told to create a machine that will perform a specific task using only materials that are found in the junkyard where the show is filmed.
  - Red Green invents many bizarre creations, to solve a "need" he identifies, using duct tape.
- Students brainstorm inventions that are based on behaviour or phenomena observed in nature (e.g., scuba palms and flippers from webbed duck feet, camera lens from dilating pupil of eye). What role does nature play in inventing?
- Discuss the saying "Necessity is the mother of invention." What do students think it means? Can students think of other sayings that would apply to learning, inventions, or discoveries? (Examples: "You can't teach an old dog new tricks." "Build a better mousetrap.")
- Students visit an Internet site that displays old technology in the home (see IMYM Links Database).

Acquiring Strategies

- Students interview parents, grandparents, Elders, and other members of their community about inventions that have improved their lives. They ask for stories about the past that show problem solving, determination, and resourcefulness in the face of challenges. Brainstorm for appropriate interview questions that will result in appropriate answers and useful information. (See TBLM ICT.10#1: Questioning.)
- As a class, list inventions that have been mentioned during the interviews. Students use BLM Mod.1.3b#1: Why Do We Invent? to list each invention, what it replaced, and how it has made a difference in people's lives.
- Students use BLM Mod.1.3b#2: Categorizing Inventions to sort inventions identified in their interview into categories (e.g., transportation, work, communication, health, household, or any other suitable category). They identify which inventions are essential to our lifestyle (e.g., indoor plumbing), which have made a life-saving difference (e.g., antibiotics), and which are merely pleasant or have improved our comfort (e.g., CD players). Concept-mapping software can be used as an alternative to the BLM.
- Make a Picture Splash of "modern conveniences" or "technological inventions" made since 1900. Arrange inventions by decades on different posters. Discuss with students suitable categories such as homes, transportation, communication, health, occupations, or industry,

and make posters by category. Students contribute ideas for each poster and find or create matching illustrations.

Applying Strategies

- As a class, review the categories students have identified and the inventions they have included in each. Students attempt to explain patterns in the data. They may observe that one person considers an item to be essential, while another person considers it to be just pleasant. By reviewing the items listed in each category, can a conclusion be drawn about the kinds of inventions that are found in each category? (For example, those that have made a life-saving difference are mainly of a medical nature.)
- Students add to this list periodically as they identify other inventions throughout the *Inventions, Innovations, and Discoveries* interdisciplinary unit. Emphasize Canadian inventions and relate them to the social conditions and historical events of the time.
- Students write a paragraph based on the class discussion, using word-processing software. They make use of signal or transition words while explaining what they think is the world's greatest invention, giving reasons for their choice, and describing what needs the invention has met. This task could also be done using BLM OLE.4#6: Reading Circle Response Log.

Variations/Extensions

- Based on interviews with their parents, grandparents, Elders, or other members of their community, students write a text on whether they think it is easier growing up today than it was one or two generations previously. They support their claim with examples based on their research.
- Based on the class discussion, students complete an Exit Slip describing an invention they would like to see developed and what needs it would meet.
- Divide students into two groups. Publish two class newspapers (see OLE.9: Newspapers), one describing a day in the life of a Canadian family after the Second World War and another of a family today. Students write features on activities that might fill a day, such as cooking, sports, shopping, or cleaning, with an emphasis on modern inventions that facilitate each activity.
- Date the inventions on the list the class made up and include these as another category on BLM Mod.1.3a#1: Sample Timeline of Discoveries.

SUGGESTIONS FOR ASSESSMENT

- Review BLM Mod.1.3b#1: Why Do We Invent? Note gaps in student understanding and confer with individual students when needed.
- Review students' paragraphs. Have they successfully supported their choice for the world's greatest invention? Have they described the needs the invention has fulfilled? Have they used signal or transition words accurately to enhance their writing?
- Note students' participation in the discussions. Do they ask relevant questions? Do they make appropriate comments? Do they show respect for their peers?

***CONNECTION TO* INVENTION CONVENTION**

- Through their interviews and investigations, students become aware that an invention meets a need. As they investigate and assess needs of people through this interdisciplinary unit, they gain a deeper understanding that will help them in creating their own useful inventions.

BLM Mod.1.3b#1: Why Do We Invent?

Name _____ Date _____

Inventions, innovations, and discoveries have come about because of people's need to change and improve their lives. List some inventions, name what they replace (predecessors), and describe in one or two sentences how they have improved our lives. An example is provided below.

Invention	Predecessor	Improvement to Our Lives
Indoor plumbing	Outhouse	• Indoor plumbing is more convenient to use than an outhouse, especially in winter. • It is more sanitary.

BLM Mod.1.3b#2: Categorizing Inventions

Name ________________________________ Date ________________________

Inventions, innovations, and discoveries have come about because of people's needs to change and improve their lives. Sort inventions into appropriate categories and identify which are essential to our lifestyle, which are lifesaving, and which merely make our life more pleasant.

Invention Category	**Essential**	**Lifesaving**	**Pleasant**
Transportation			
Health			

Then and Now: Advances in Computer Technology **Mod.1.3c**

TIME
180 minutes

OVERVIEW
Students explore the concept of "innovation." They investigate the invention of the computer, from the first mainframe to the latest wireless palm computer, and note the changes and improvements (innovations) that have been made to that invention over time.

LEARNING OUTCOMES
Through this learning experience (LE), students will achieve specific learning outcomes (SLOs) in various subject areas. Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified.

English Language Arts
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:

- 2.1.1 *Prior Knowledge* — Seek connections between previous experiences, prior knowledge, and a variety of texts.
- 2.3.5 *Create Original Texts* — Create original texts [such as letters, short stories, media broadcasts, plays, poems, video presentations, Readers Theatre…] to communicate and demonstrate understanding of forms and techniques.
- 3.2.2 *Identify Sources* — Answer inquiry and research questions using a variety of information sources [such as bulletin boards, art, music, skilled community people, CD-ROMs, Internet…].
- 3.2.5 *Make Sense of Information* — Use organizational patterns of oral, visual, and written texts [including main ideas and supporting details, explanation, comparison and contrast, cause and effect, and sequence] to construct meaning; skim, scan, and read closely to gather information.
- 3.3.1 *Organize Information* — Organize information and ideas using a variety of strategies and techniques [such as comparing and contrasting, classifying and sorting according to subtopics, sequences, order of priority or importance...].
- 3.3.2 *Record Information* — Make notes on a topic, combining information from more than one source; reference sources appropriately.
- 3.3.4 *Develop New Understanding* — Relate gathered information to prior knowledge to reach conclusions or develop points of view; establish goals for developing further inquiry or research skills.
- 4.2.4 *Enhance Artistry* — Choose language, sounds, and images [including transitional devices] to enhance meaning and emphasis.

Science
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:

- SLOs related to Scientific Inquiry or the Design Process in Cluster 0: Overall Skills and Attitudes.

Social Studies
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which SLOs students may achieve, in addition to those identified below:
- 6-KE-057 Give examples of the impact of technological development on life in Canada from 1914 to 1945.
  Examples: electricity, telecommunication, transportation, medicine, industrialization...
- 6-KE-058 Give examples of ways in which industry and technology have changed life in Canada since 1945.
  Examples: urbanization, transportation, communication, education...

ICT LITERACY SKILLS AND COMPETENCIES
Consider the intent of this LE and your choice of instructional and assessment strategies to determine which skills and competencies students may achieve, in addition to those identified below:
- basic operating skills
- inquiry, using electronic sources
- word processing

SUGGESTED LEARNING RESOURCES
Software
- word processor

Internet
- IMYM Links Database: <http://www.edu.gov.mb.ca/ks4/tech/imym/resources/links.html>
- Search the Internet using the term “computer history.”

CD-ROM
- electronic encyclopedia

Print
- Selected Bibliography
- Appendix C: Index of Teaching and Learning Strategies and Tools
- Manitoba Education and Training. *Grades 5 to 8 English Language Arts: A Foundation for Implementation.* Winnipeg, MB: Manitoba Education and Training, 1998. (See Wall Chart: Questions for Evaluating the Usefulness of Information, Grade 6, 212.)

BLMs
- BLM Mod.1.3a#1: Sample Timeline of Discoveries
- BLM Mod.1.3c#1: Compare and Contrast Frame

TBLMs
- TBLM OLE.2#1: Daily Edit Concept Chart
- TBLM Mod.1.3c#1: Checklist for Evaluating Information Sources
- TBLM Mod.1.3c#2: Sample Chart for Inventions and Innovations

Materials
- class Timeline of Discoveries chart and Picture Splash, developed in Mod.1.3a: Back to the Future: A Timeline of Discoveries

SUGGESTIONS FOR INSTRUCTION

Preparation and Set-up

- Gather resources showing and describing different models of computers over the years.
- Make and post a Wall Chart: Questions for Evaluating the Usefulness of Information (see Suggested Learning Resources).
- Add a section for computers to the class Timeline of Discoveries chart developed in Mod.1.3a: Back to the Future: A Timeline of Discoveries (see BLM Mod.1.3a#1: Sample Timeline of Discoveries).

Activating Strategies

- **Note:** Teach concepts such as discoveries, inventions, and innovations separately to facilitate clearer understanding. Start with discoveries and proceed in a similar fashion on consecutive days for inventions and innovations.
- As a class, brainstorm inventions from years ago that are still in use today. Refer to the class Timeline of Discoveries chart made in Mod.1.3a: Back to the Future: A Timeline of Discoveries. Examples could include: refrigerators, stoves, telephones, radios, or lamps. How can these inventions still be in use today? They have evolved to meet our needs and they are better supported by the technology and the resources around us.
- Students look up the meaning of “innovations” in their dictionaries. Can they infer the meaning of “innovation” as it relates to “inventions”? To brainstorm innovations brought to modern inventions, use TBLM Mod.1.3c#2: Sample Chart for Inventions and Innovations or the list made with BLM Mod.1.3b#1: Why Do We Invent?
- Discuss how innovations have made these modern inventions easier to use and better suited to our present-day lifestyle.
- Introduce an early computer such as ENIAC (Electronic Numerator Integrator Analyzer and Computer) by reading an article on that topic from an electronic encyclopedia or a website. Use a computer and a projection system to enable students to view the text while you read it.

Acquiring Strategies

- Students use resources gathered for this LE, including websites, to find more information about early forms of computers.
- Each student chooses one early version or model of computer as well as a current model to research and compare.
- Review the Wall Chart: Questions for Evaluating the Usefulness of Information with students. They take notes on each of their chosen models of computers. Some categories to consider are: size, speed, operation, cost, availability, appearance, memory, use, special features, and date of creation.

Applying Strategies

- Using BLM Mod.1.3c#1: Compare and Contrast Frame, students record information about how their chosen computers are alike and different, using data from several categories. They write a statement to compare and contrast the two.

Variations/Extensions

- Instead of researching computers, students research one of the inventions they brainstormed at the beginning of this LE.
- Students research inventions of First Nations and Inuit peoples, such as toboggans, canoes, kayaks, and snowshoes. They discuss innovations made after the items were invented (e.g., canoes can be made of aluminium) and describe their use today.

- Use the information gathered by the students to make a timeline of computer history, or include the data collected on the Timeline of Discoveries created in Mod.1.3a: Back to the Future: A Timeline of Discoveries, as a separate entry.
- Using a word processor, students write a text discussing whether people believe they are any happier today than they were 20 years ago because of the improvements in communication technology (e.g., computers, cell phones, answering machines). Find opinions on the Internet to support the text.

SUGGESTIONS FOR ASSESSMENT

- Read students' responses to BLM Mod.1.3c#1: Compare and Contrast Frame. Were they able to make a statement to compare and contrast their two chosen computers, based on the information they had found?
- Observe students as they search for information. Refer to a checklist such as TBLM Mod.1.3c#1: Checklist for Evaluating Information Sources.

CONNECTION TO INVENTION CONVENTION

- Through their interviews and investigations, students become aware that an invention meets a need. As they investigate and assess the needs of people through this interdisciplinary unit, they gain a deeper understanding that will help them in creating their own useful inventions.

BLM Mod.1.3c#1: Compare and Contrast Frame

Name _____ Date _____

Compare and contrast two terms, concepts, or events.

C O M P A R E	How are	and	**alike?**

C O N T R A S T	How are	and	**different?**

Write a statement to compare and contrast the two terms, concepts, or events.

Compare and Contrast Frame: Used by permission of Lynda Matchullis and Bette Mueller, Prairie Spirit School Division.

TBLM Mod.1.3c#1: Checklist for Evaluating Information Sources

Topic _____ Date _____

Evaluating Information Sources	**Student Names**																	
The student																		
• uses pre-established criteria to evaluate information sources																		
• self-questions to determine appropriateness of sources																		
• discards inappropriate sources																		
• differentiates between suitable and unsuitable information																		
• recognizes that information serves different purposes																		

Checklist for Evaluating Information Sources: Adapted from *Grades 5 to 8 English Language Arts: A Foundation for Implementation* (Manitoba Education and Training, Grade 6, 213).

TBLM Mod.1.3c#2: Sample Chart for Inventions and Innovations

Name _____ Date _____

Predecessor	Invention	Innovation
Outhouse	Indoor plumbing	Water-saving toilet
Moccasins	Snowshoes	Snowshoes of different shapes for different types of snow
Manual typewriter	Electric typewriter	Self-correction tape
Wood-burning stove	Electric stove and oven	Self-cleaning oven
Ice box	Electric refrigerator and freezer	Self-defrosting freezer
Blade razor	Disposable razor	Twin-blade and triple-blade razor