

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: <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • a new planet (e.g., Pluto in 1930) • comets • asteroids • moons of planets • black holes • galaxies
Chemical Discoveries	<ul style="list-style-type: none"> • a new chemical compound • glue for self-adhesive note paper • natural gas in Leduc, Alberta • radioactivity • diamond deposits in northern Manitoba
Mathematical Discoveries	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.

