Chart This (Spreadsheet) **ICT.9**

TIME
90 minutes

OVERVIEW
Students use a spreadsheet to record and graph information about common characteristics, traits, and/or tastes of their classmates. This learning experience can be adapted to record and graph data from any current unit of study.

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:

- 3.1.2 *Ask Questions*—Ask general and specific questions on topics using predetermined categories.
- 3.1.4 *Create and Follow a Plan*—Select and use a plan for gathering information.
- 3.3.2 *Record Information*—Make notes of key words, phrases, and images by subtopics; cite authors and titles of sources alphabetically.
- 5.2.1 *Cooperate with Others*—Appreciate that everyone in a group has to work together to achieve cooperative and collaborative group tasks, and act accordingly.
- 5.2.2 *Work in Groups*—Take roles and share responsibilities as a group member.

Mathematics
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:

Patterns and Relations (Patterns)
4.PR.1. Identify and describe patterns found in tables and charts, including a multiplication chart.
[C, CN, PS, V]

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
- spreadsheet analysis

SUGGESTED LEARNING RESOURCES
Software

- spreadsheet

Print

- Appendix C: Index of Teaching, Learning, and Assessment Strategies

BLMs
- BLM ICT.1#2: Survey of Information and Communication Technology (ICT) Skills
- BLM OLE.5#2: Share the Learning Journal
- BLM OLE.8#2: What Have I Learned?

TBLMs
- TBLM ICT.2#1: Skill Know-How Checklist
- TBLM ICT.9#1: Questioning
- TBLM ICT.9#2: Steps for Developing a Survey
- TBLM OLE.2#1: Daily Edit Concept Chart

SUGGESTIONS FOR INSTRUCTION

Preparation and Set-up
- Become familiar with the functions of the spreadsheet software installed on the class computers.
- Create a sample spreadsheet file and use it to demonstrate the software. As an example of an authentic use of a spreadsheet, make a spreadsheet of students' ICT skills, collected from BLM ICT.1#2: Survey of Information and Communication Technology (ICT) Skills. Use codes or numbers rather than student names.
- Review the database of students' ICT skills, as expressed on BLM ICT.1#2: Survey of Information and Communication Technology (ICT) Skills, to identify possible student helpers for ICT.9: Chart This.
- Customize TBLM ICT.2#1: Skill Know-How Checklist for this ICT to make ongoing observations of students' skills.

Activating Strategies
- Ask a few students to state their favourite food, subject, or activity.
- Students predict what will be the most popular food, subject, or activity.
- Survey all students in the class for their favourite food, subject, or activity.
- Discuss ways of recording the survey data and displaying the results.
- Using a computer and a projection system, demonstrate the characteristics of a spreadsheet (using the previously created spreadsheet file of students' ICT skills, or any other appropriate data). Point out similarities with word processing and other software students are already using.

Acquiring Strategies
- Create a new spreadsheet file. Enter the information gathered about favourite food, subject, or activity in the new spreadsheet file, modelling the use of the software to students.
- Students discuss what kind of graph will best display the spreadsheet data.
- Use the graphing function of the spreadsheet application to display the results visually and to show students how to use the graphing function.

Applying Strategies
- In collaborative groups (see OLE.10: Electronic Collection), students decide on a topic for a survey to conduct within the class about a characteristic (e.g., number of persons in family), trait (e.g., hair colour, height), or taste (e.g., favourite sport, TV show) of their classmates. They draft their survey questions (see TBLM ICT.9#1: Questioning and TBLM ICT.9#2: Steps for Developing a Survey).

- Students decide how the information will be recorded in the spreadsheet and how it will be graphed to represent the gathered data most effectively.
- Students conduct the survey and enter the data in the spreadsheet. They use their spreadsheet to graph and visualize the data, analyze the graphical representations of the data, and write conclusions based on the graphs obtained.

Variations/Extensions

- List other uses for a spreadsheet, such as recording marks, listing books read, making schedules, recording new vocabulary words, and creating a class dictionary. Discuss what makes a spreadsheet program more useful than a word processor for dealing with data. (For example, data can be sorted, edited, graphed, and represented.)
- Each student records his or her daily results from OLE.2: Daily Edit and OLE.3: Daily Math and Problem Solving using a spreadsheet. Students create a monthly graph of their results and interpret the graph for fluctuations.
- Students create journal entries using BLM OLE.5#2: Share the Learning Journal as they make learning discoveries. They use their journals to prepare for sharing sessions and bring home their journals each week.

SUGGESTIONS FOR ASSESSMENT

- Determine whether students are using the best graphing format to represent the data collected.
- Students reflect on their learning related to this ICT as they update BLM OLE.8#2: What Have I Learned? during reflection time (see OLE.8: Reflection Journal). They list newly acquired skills.
- Assess students' performance in using a spreadsheet when they create and analyze their survey.

***CONNECTION TO* COMMUNITY AND DIVERSITY**

- Students use a spreadsheet to record and analyze information from data collected during the *Community and Diversity* interdisciplinary unit.

TBLM ICT.9#1: Questioning

Overview
Questioning is fundamental to learning. Effective questions not only trigger searches for meaning but also encourage elaborative thinking. Powerful questions have the capacity to transform students from information seekers to information users. In addition to answering questions, students should learn how to pose their own questions.

1. "Why," "How," and "Which" Questions
Jamie McKenzie and others identify three powerful questions:

- **"Why" questions** (e.g., "Why do things happen the way they do?") require analytic and cause-effect thinking. "Why" questions lead to problem solving.
- **"How" questions** (e.g., "How could things be better?") are asked in order to solve problems.
- **"Which" questions** (e.g., "Which is best?") require decision making based on examining clearly stated criteria.

2. Guiding Questions
While different terms may be used to describe guiding questions, their purpose remains the same: to focus an inquiry.

Jamie McKenzie uses the term "essential" rather than "guiding" and offers this comment:

> Essential questions reside at the top of Bloom's Taxonomy (Bloom). They require students to EVALUATE (make a thoughtful choice between options, with the choice based upon clearly stated criteria), to SYNTHESIZE (invent a new or different version) or to ANALYZE (develop a thorough and complex understanding through skillful questioning). ("Using Essential Questions As the Basis for Student Investigations" <www.fno.org/sept96/questions.html>)

Guiding questions are prepared by the teacher and should meet specific criteria. Guiding questions should

- highlight the concepts to be learned (e.g., Learn about the characteristics of a legend.)
- be suitable for investigation (e.g., Students can investigate legends and other genres to discover the characteristics of each.)
- fulfill curricular outcomes (e.g., The English language arts curriculum outlines several specific learning outcomes that focus on understanding genre: 2.2.1, 2.3.1, 2.3.2, and 2.3.5)
- be understood by students (e.g., Questions must be stated simply so students understand what they are expected to learn.)

Continued

TBLM ICT.9#1: Questioning *(Continued)*

3. Inquiry Questions

Inquiry questions guide an inquiry. They are sometimes also called "foundation" questions or "subsidiary" questions.

Inquiry questions are developed by students, with teacher guidance. They should be broad questions that require elaborate and comprehensive answers.

Example:

- I wonder about _____.
- I want to know what, when, where, who, and why _____.
- Why does_____?
- How is _____ like _____?
- How is _____ different than _____?
- Which _____ is preferred, and why?
- Why not _____?
- What if _____?

4. Interview Questions

Interviewing is an important method of collecting information without requiring students to read, making it especially suitable for younger students.

To begin, ask the four W questions: Who? What? When? Where?
Next, proceed with interpretive questions such as

- Why did you _____?
- How did you _____?
- Which aspects of _____ are most important to you? Explain.
- What would you change, and why would you change it?

References

Manitoba Education and Training. *Kindergarten to Grade 4 English Language Arts: A Foundation for Implementation.* Winnipeg, MB: Manitoba Education and Training, 1998. (See Questioning, Strategies That Make a Difference, 30–36.)

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McKenzie, Jamie. "The Question Is the Answer: Creating Research Programs for An Age of Information." *From Now On: The Educational Technology Journal* 7.2 (Oct. 1997). <http://questioning.org/Q6/question.html>.

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McKenzie, Jamieson A., and Hilarie Bryce Davis. "Filling the Tool Box: Classroom Strategies to Engender Student Questioning." *From Now On: The Educational Technology Journal* (1999). <http://questioning.org/toolbox.html>.

TBLM ICT.9#2: Steps for Developing a Survey

1. Include a brief explanation of what you are doing and why you need the information you will be collecting.

   Example: I am planning to help my family be better stewards of the environment.

2. Include a clear explanation of the format of the questionnaire and how to answer it.

   Example: There are _____ questions in this survey.

   They are presented in (explain the format[s]) _____.

3. Ask few questions (four or five). Too many questions could cause respondents to become impatient and give incomplete answers.

4. Ask questions in the affirmative. Avoid the use of “not.”

   Example: What activities do you like to do on holidays? (Avoid: “not like”)

5. Select an appropriate format for questions. Consider one or a combination of the following:

   - Yes/No

     Example: Do you turn your thermostat down at night? ____

   - Multiple Choice

     Example: What items do you currently recycle?

     ____ cans ____ paper ____ don’t recycle

     ____ glass ____ plastic

   - Open-Ended, Numeric

     Example: How many minutes do you idle your vehicle before driving off? ____

6. List the questions in order from establishing the needs or preferences of respondents to building up to the purpose of the survey, which is how the needs can be fulfilled.

7. Test the questionnaire on a partner. Ask for feedback on whether the questions are clear or how they could be improved.