

Graphing: Charting Attendance



Lesson Planning Approach

Some learners perceive their “world” as a whole, where things are interconnected and dependent upon each other. These “integrated” students face major challenges in coping with our dominant educational, social, and economic systems, which tend to present information in a linear fashion without the necessity of integration into meaningful context. Integrated students are at-risk of failing as that they attempt to grasp information in ways that do not match their experience. Among large populations of at-risk students are many from Native American and similar cultures that do not regard their world as a sum of parts but as a blend of all they experience.

This lesson plan does include some traditional, linear approaches to delivering information (checklists, rules, analysis, problem solving and organization). In addition to the traditional linear delivery of information, this lesson plan also includes some of the following strategies designed to appeal to at-risk students as they learn academic/life skills:

- ❖ Integration of technology
- ❖ Story telling/anecdotal information
- ❖ Non-competitive group or team work
- ❖ Performance-based assessment and rubrics
- ❖ Visual presentations and practice through technology and other means
- ❖ Project-based assignments that integrate family and community
- ❖ Activities appealing to multiple intelligences (Gardner)

Lesson Overview

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This lesson was designed as a culminating activity for third graders investigating using graphs to communicate information. In this lesson, students will track classroom attendance for one week and present the information using different forms of graphing. Because this is a comparative study, information will need to be collected from several different classrooms. Although this lesson was developed for tracking attendance, the same lesson could be applied to fundraising activities, the number of books read by a class, or any other data generating activity. This lesson was developed for third graders, however it could be applied to learners of any level. The rubric attached to this document has been developed to measure the level of independence in using the MS Excel program.

Lesson Objectives

Project Objectives: When students complete this session, they will be able to...

- ❖ Collect data, use tables to organize the data, use the information from the tables to create different types of graphs, and communicate the information contained in the graphs to others to others using problem solving skills. .

Integration of other Functional/Academic Skills: (Critical thinking is required throughout the lesson:) Students will be able to:

Math	Collect data using tally marks Organize data in a table Use tables to create graphs Use graphs for problem solving activities
Reading	Read and interpret information from a graph
Writing:	Write an explanation of information contained in a graph
Speaking:	Express information gained from graphic representations

State/National Standards

Colorado Model Content Standards for Mathematics:

- ❖ Standard 1: Students develop number sense and number relationships in problem solving situations and communicate the reasoning used in solving these problems.
- ❖ Standard 3: Students use data collections and analysis, statistics and probability in problem solving situations and communicate the reasoning used in solving these problems.
- ❖ Standard 6:m Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper and pencil, calculators, and computers in problem solving situations, and communicate the reasoning used in solving these problems.

Websites

None required for this lesson. www.Marcopolo.worldcom.com has some good additional lesson plans for mathematics and graphing under the Illuminations link.

Prerequisites

Prior to teaching this lesson students should be able to:

- ❖ Know the parts of a graph and labeling
- ❖ Read and understand bar, line and circle graphs
- ❖ Have some experience in communicating their mathematical thinking graphically
- ❖ Be comfortable with numbers to 100
- ❖ Have access to attendance data (or other chosen activity data)

Required Materials

- ❖ Pencil and paper

Required Equipment/Technology

- ❖ Computers with MS Excel. Parts of this lesson would be best suite for a computer lab

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- ❖ Access to the Internet if using Marco Polo Site
- ❖ Color printer: Helpful and fun but not required

Handouts

- ❖ Handout 1: Checklist for the project
- ❖ Handout 2: Pets in the Home Tally Mark activity
- ❖ Handout 3: Data Collection Form
- ❖ Handout 4: Bar Graph, Circle Graph, and Line Graph Samples
- ❖ Handout 5: Steps for Creating a Graph Using MS Excel
- ❖ Handout 6: Interpretive Questions
- ❖ Handout 7: Word Web Handout
- ❖ Handout 8: Using MS Word
- ❖ Handout 9: Assessment Rubric: Graphing

THE LESSON

Part 1: Gathering the Information

Preparation

Activity	Instructor Notes
Students discuss purpose of gathering information.	Discuss why people need to gather information. Discuss ways information can be gathered. Discuss the pros and cons for each method. Keep this list for later use.
Students discuss the types of data that is collected by the school.	Students brainstorm a list of data that may be collected by schools. For example: Test scores, attendance, lunch money, bus numbers/riders, enrollment etc. Introduce attendance as the data to be collected for this project. Discuss the uses of the information the students will be gathering.

Presentation

Activity	Instructor Notes
Students will choose a method of data collection for this project.	Review differing ways to collect data. Have students select a method most applicable to the type of data to be collected.

Students will learn how to use tally marks to record data.	Review counting by fives. Introduce and practice using tally marks by creating a table for the different types of pets in the home (Handout 2).
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Performance and Practice

Activity	Instructor Notes
Students will use tally marks to record daily attendance for a one-week period.	Break students into small groups. Assign each group a classroom in the school whose attendance they will track using Handout 4. As students enter the classroom, the record keepers track their arrival with tally marks. Remind students not to forget to count themselves! Have students visit the other classrooms to complete their survey.

Part 2: Creating the Graphs Preparation

Activity	Instructor Notes
In the same small groups, students will create a table for their information.	Using Handout 4, students will transfer information from their data collection sheet to the survey table.
Students will look at several different types of graphs and discuss each one's uses.	Using Handout 5, students will discuss the following graphs: Bar graphs, line graphs, and circle graphs. Groups will decide which type of graph they would like to use for their study.

Presentation

Activity	Instructor Notes
Students will learn how to enter information into a table in MS Excel using sample data.	Using Handout 6, guide students through entering information into Excel. Enter data provided on Handout 6 for data entry.
Students will learn how to use Ms Excel to	Continue to work through Handout 6 for creating the three different graphs.

create sample graphs.	
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Performance and Practice

Activity	Instructor Notes
Students will enter information from their data table into Microsoft excel.	Distribute Handout 6 to each group. Have students work through the steps for creating a table using MS Excel.
Students will use the different table options to create a graph to represent the information they collected.	Have each group choose one graphing option to use to represent their data. Use Handout 6 to guide them through the graphing process.
Students will print graphs for discussion.	Allow students to change colors of graphs prior to printing.

Part 3: Presenting the Material Preparation

Activity	Instructor Notes
Students will answer interpretive questions about their graph.	In their small groups, students will answer interpretive questions about their project. The questions are found on Handout 7.
Students will list the information they gathered from their data collecting and recording project.	Using the word web found on Handout 8, students will list information they learned from their graphing project.

Presentation

Activity	Instructor Notes
Students will write a paragraph using MS Word to explain their graph.	Using Handout 9 and the information from Handouts 7 and 8, students work through the writing of a paragraph to present to the class offering an explanation of their graph.

Performance and Practice

Activity	Instructor Notes
Students will present their graphs and their interpretation to the class.	Students present their paragraph to the class. Final assessment of student performance is found on Handout 10.

Lesson Assessment Strategy (Formative- as the lesson progresses)

Preparation, Presentation, And Overall Implementation (Instructor)

1. Am I addressing the learning needs of all my students?
2. Am I familiar with MS Excel and graphing?
3. Do my students have a good grasp of graphing prior to the start of this lesson?
4. Are the students clear on their learning objectives?

Performance and Practice (Student)

1. Do my students have the necessary pre-requisites to complete this activity?
2. Are my groups compatible for this activity? Will each student get a chance to participate?
3. Do my students understand how to order and present information in a graph?

Technology

1. Does the technology work?
2. Are there enough computers available for this lesson to be successful?
3. Are my students comfortable working with the necessary technology?
4. Am I comfortable working with the necessary technology?

Handout 1: Checklist for the project

Activity:	Completed:
Students discuss purpose of gathering information.	
Students discuss the types of data that is collected by the school.	
Students will choose a method of data collection for this project.	
Students will learn how to use tally marks to record data.	
Students will use tally marks to record daily attendance for a one-week period.	
In the same small groups, students will create a table for their information.	
Students will look at several different types of graphs and discuss the uses for each one.	
Students will learn how to enter information into a table in MS Excel using sample data.	
Students will learn how to use Ms Excel to create sample graphs.	
Students will enter information from their data table into Microsoft excel.	
Students will use the different table options to create a graph to represent the information they collected.	
Students will print graphs for discussion.	
Students will answer interpretive questions about their graph.	
Students will list the information they gathered from their data collecting and recording project.	
Students will write a paragraph using MS Word to explain their graph.	
Students will present their graphs and their interpretation to the class.	

Handout 2: Pets in the Home Tally Mark activity



Pets Students Have at Home

Pets	Tally Marks
Dogs	
Cats	
Fish	
Horses	
Mice	
Guinea Pigs	
Hamsters	
Gerbils	
Other	

Handout 3: Data Collection Form

Attendance Record for: _____

	Number Present	Number Absent
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Weekly Total:		

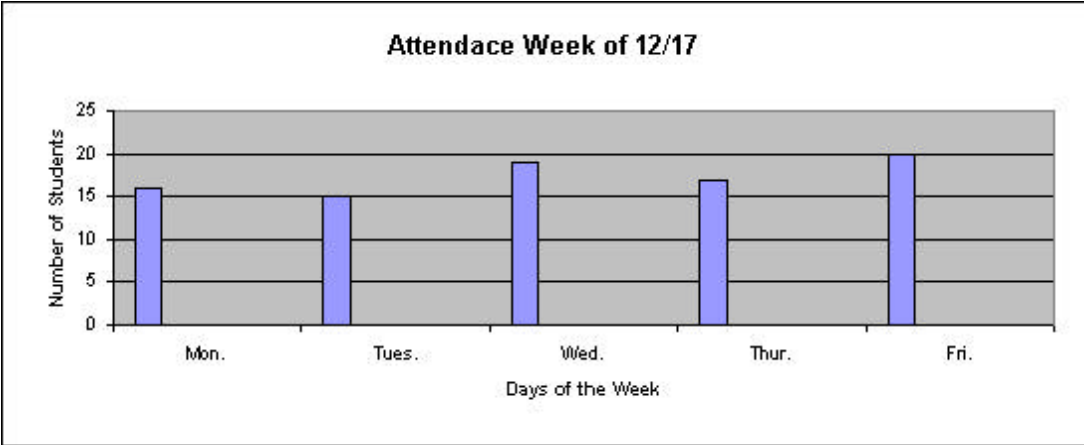


Handout 4: Bar Graph, Circle Graph, and Line Graph Samples

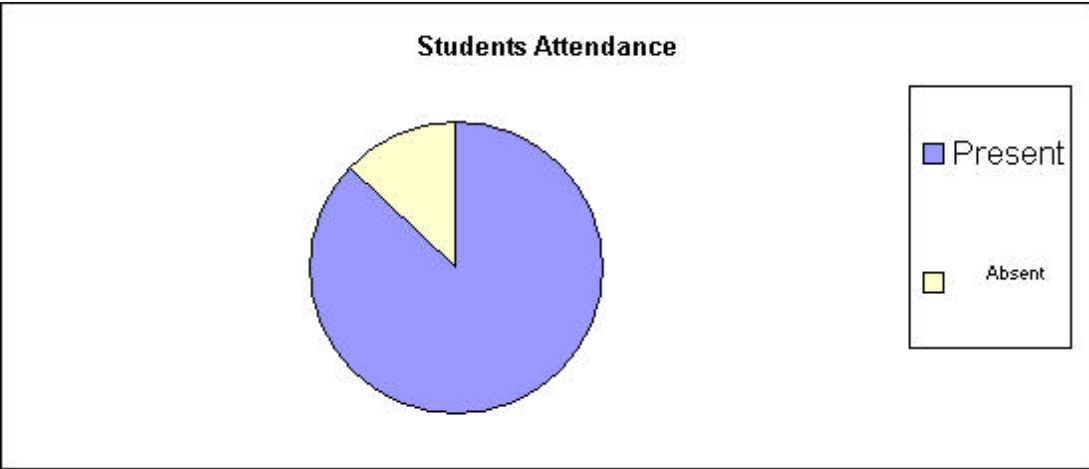
Table of Attendance for the week of 12/17 to 12/21

	Present	Absent
Mon.	16	4
Tues.	15	5
Wed.	19	1
Thur.	17	3
Fri.	20	0
Total:	87	13

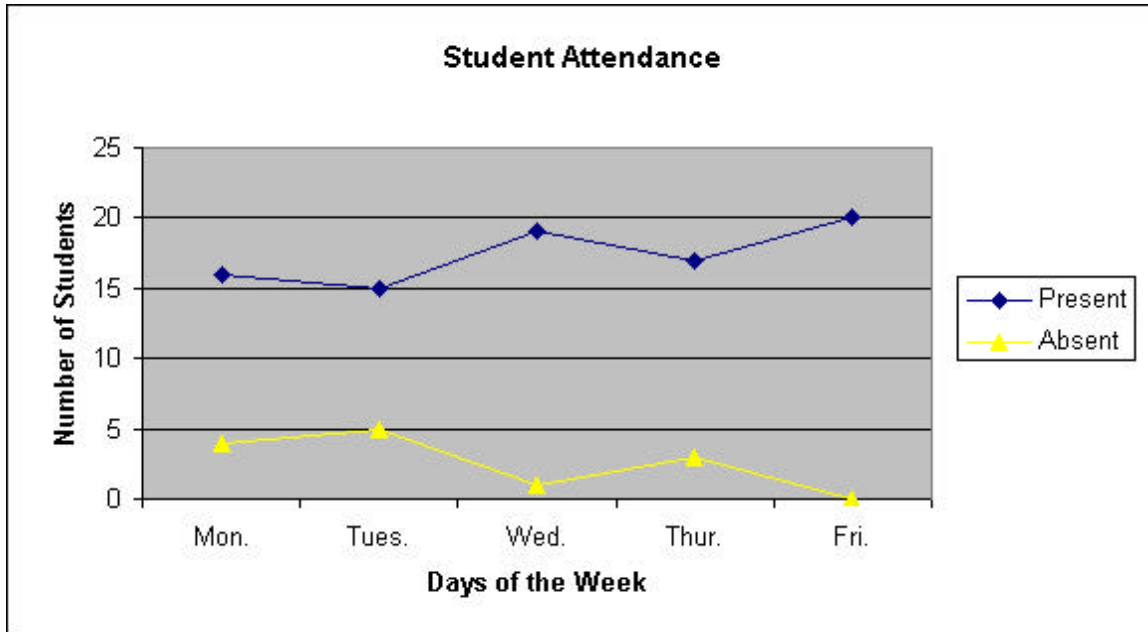
Bar Graph



Pie Graph



Line Graph



Handout 5: Steps for Creating a Graph Using MS Excel

Activity:	Completes
Locate, select, and open MS Excel Program.	
Create a table by labeling a title, the columns, and the rows. It is best not to skip rows and columns.	
Enter data in the table using the cell format. Highlighting columns and selecting the Sigma button on the tool bar can find totals. It looks like a capital "E".	
Locate and select the Chart Wizard button from the tool bar. It looks like miniature graphs.	
Select the type of chart you wish to create.	
Click "next to proceed.	
Select the type of "Graph" you wish to use.	
Enter the "Data Range" by selecting all of the information you want included from the chart. Click "Next".	
Select the location for the legend. Click "Next". Select "Titles" if they are to be included in the graph.	
Decide if the chart is to be included as part of the document or if it is to be created as a new document. Click "Finish".	
The chart can be re-labeled using cut, copy and paste options.	





Interpreting Graphs: Questions to ask yourself

1. Which day had the best attendance?
2. Which day had the worst attendance?
3. How many more student were here on the best day than on the worst day?
4. Were there any days that had the same attendance rates?
5. Compare your class' attendance rate with another class'? Who had better attendance?
6. Is there a reason that one day's attendance was better than another days?
7. Why is it easier to think about data in the graphic form rather than numerical form?

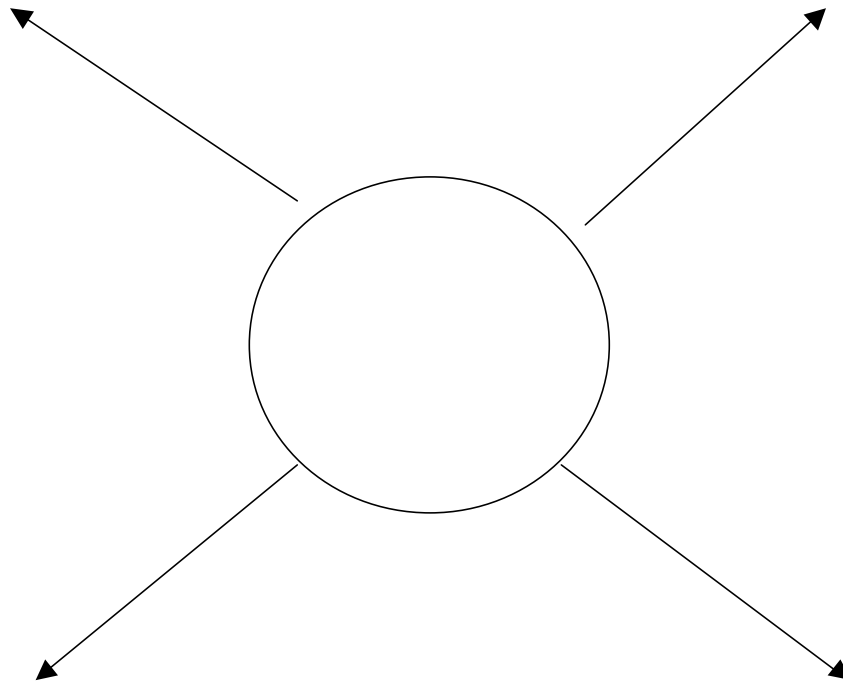
Handout 7: Word Web Handout

1.

- a.
- b.
- c.
- d.

2.

- a.
- b.
- c.
- d.



3.

- a.
- b.
- c.
- d.

4.

- a.
- b.
- c.
- d.

Handout 8: Using MS Word

Skills Checklist

Skills Checklist:	Completed:
Open Microsoft Word by locating the W Icon.	
Find and choose correct font from font pull down files.	
Find and choose correct size from print size pull down files.	
Use centering feature to center the title of the paragraph.	
Type and underline the title of the paragraph.	
Use "enter" to begin paragraph.	
Use "tab" to indent paragraph.	
Type text of paragraph from the word web in handout two and/or the paragraph outline in handout 4.	
Use the "control s" command to save work in progress.	
Upon completion of the paragraph, use the error marking features to correct spelling and grammar errors as noted.	
Have the teacher check the work.	
Locate and select the "save as" icon from the file menu.	
Save file in folder labeled with the topic.	
Close the word program.	
Open the folder to check the location of the files.	

Handout 9: Assessment Rubric

Skill	0	1	2	3
Students discuss purpose of gathering information.	Not observed at this time.	Students list one purpose for gathering information with prompting.	Students list a couple of reasons for gathering information with prompting.	Students are able to list several reasons for gathering information without prompts.
Students will choose a method of data collection for this project.	Not observed at this time.	Students choose a method with teacher prompting throughout the process.	Students choose a method with limited prompting.	Students independently choose a method.
Students will use tally marks to record daily attendance for a one-week period.	Not observed at this time.	Students need prompts in both using tally marks and recording data.	Students need prompts in either using tally marks or recording data.	Students are able to use tally marks and record data independently.

Skill	0	1	2	3
Students will create a table for their information.	Not observed at this time.	Students create a table with prompting.	Students need minimal assistance in creating a table.	Students are able to create a table independently.
Students will enter information from their data table into MS Excel.	Not observed at this time.	Students enter data into the MS Excel program with prompting.	Students need minimal assistance in entering data into a table.	Students are able to independently enter data.
Students create a graph to represent the information they collected.	Not observed at this time.	Students create a graph with frequent prompting.	Students need few prompts to assist with creating a graph.	Students create a graph independently.
Students will write a paragraph using MS Word to explain their graph.	Not observed at this time.	Student needs frequent prompts for writing a paragraph.	Student needs few prompts for writing a paragraph.	Student independently writes interpretive paragraph.
Students will present their graphs and their interpretation to the class.	Not observed at this time.	Students needs frequent prompts to present information.	Student needs few prompts for presentation of graphs.	Student independently presents information from graphs to the class.