

## **Teacher Instructions**

**Title:** Using Quantitative Measures to Describe Your Community

**Grade Focus:** 3, 4, 5

**Subject:** Math: Data Analysis

**Technology Integration:** PowerPoint Presentations

**Recommended Time to Completion:** 10-12 days, 30-40 minutes a day

**INTRODUCTION:** Students will learn how to compose a survey, collect data and then display that data using line graphs, bar graphs and pie charts utilizing the Excel program. Students will choose specific elements (places, organizations, etc.) in their community and perform quantitative measurements of things in locations, e.g., a pizza at a pizzeria; the computers in a library; the members of an organization.

**PREREQUISITE EXPERIENCE:** Prior to this lesson, so that Microsoft Excel and PowerPoint can be used, respectively, for quantitative and presentation tools, students and teachers should be familiar with functions of Microsoft Excel (formatting background, changing font color, graphs, etc.) Students will also need to be familiar with Microsoft PowerPoint.

### **Important Vocabulary Words to Review:**

Graph

Plot

Line Graph

Bar Graph

Pie Chart

Key

x-axis

y-axis

## TEACHER PREP TIME: 1 –2 Hours

Review this training video from Nortel LearnIT.

PowerPoint Presentations,

[http://nortellearnit.org/technology/PowerPoint\\_Presentations/](http://nortellearnit.org/technology/PowerPoint_Presentations/)

Be familiar with creating charts and graphs using Excel.

[http://www.Internet4classrooms.com/Excel\\_create\\_chart.htm](http://www.Internet4classrooms.com/Excel_create_chart.htm)

Prior to the lesson, you may want to review these videos

Math Mastery: Graphs and Statistics. Math Mastery. 2001.  
unitedstreaming. 9 March 2008

<http://streaming.discoveryeducation.com/>

Learning to Use Graphs. 100% Educational Videos. 2000.  
unitedstreaming. 9 March 2008

<http://streaming.discoveryeducation.com/>

If you do not have access to United Streaming, you can sign up for a free 30 Day Trial at [www.unitedstreaming.com](http://www.unitedstreaming.com).

*"Discovery Education streaming is a digital video-on-demand and online teaching service to help improve students' retention and test scores; it is aligned to U.S. state and provincial standards." If you do not have access to United Streaming, you can sign up for a free 30 day trial at [www.unitedstreaming.com](http://www.unitedstreaming.com)*

While the students are collecting their data, the teacher can present types of graphs and how they compare or contrast. Also, analyze published graphs and challenge students to determine why certain graphs were used in certain situations. Give examples of how this type of quantitative measurement applies to things in the community. Important: Give examples of WHY having this quantitative information is useful, makes a difference, e.g., restaurants compete on pizza sizes, so you need to know about yours vs the competition; to make a case for more computers, librarians have to know how many they have, how often used, what the demand is; to plan a trip for a Scout troop, you have to know how much gear or food is needed per participant (if you have data on what you used—or didn't use--last year, you can base this year's needs on that.

**MATERIALS:**

- (3) poster board/large construction paper
- markers
- overhead graph paper,
- large multi-colored circle (about 2-3 inches in diameter)
- computer with Excel
- clipboards,
- pencils
- poster boards
- markers/crayons
- construction paper

**PROJECT:** Tables, surveys, and graphs will be created in an Excel Document. Students will be asked to create line plots, bar graphs and circle graphs. Time outside of the classroom will be needed in order for the students to collect data.

**ASSESSMENT/GRADING:**

An evaluation rubric has been provided to use in assessing the presentations.

**TIME MANAGEMENT TIP:** Students will work together in groups. This will help students collect the data necessary to complete the graphs.

## **Engage**

### **Engage**

1. What are some types of pizza available at a pizza restaurant? List your ideas on the board or overhead. Now, look at the list and choose your favorite kind of pizza. Make a tally mark on the list.
2. Decorate a blank cut out of a slice of pizza. On a large sheet of paper, write the names of the various types of pizza on the bottom. Place your slice of pizza by the name of your favorite kind of pizza.
3. What title would you give this graph? What key should be used for this graph? Discuss ideas with your table group and share your thoughts with the class.

## Explore

### Explore

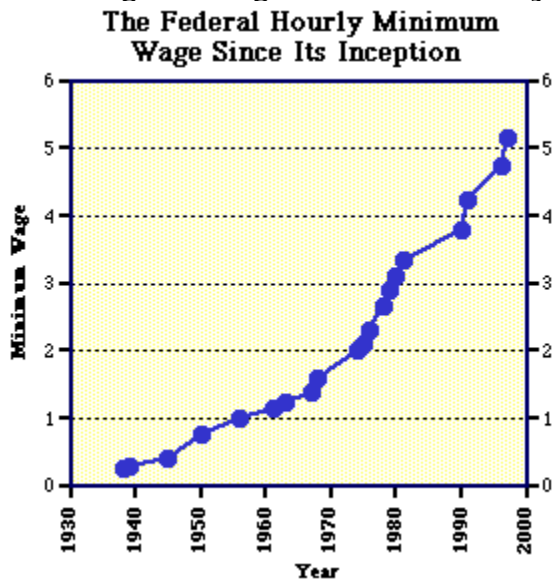
You are going to learn about three types of graphs: bar graph, line graph, and pie chart.

Bar Graph: Bar graphs are used to display data in a similar way to line graphs. However, rather than using a point on a plane to define a value, a bar graph uses a horizontal or vertical rectangular bar that levels off at the appropriate level.

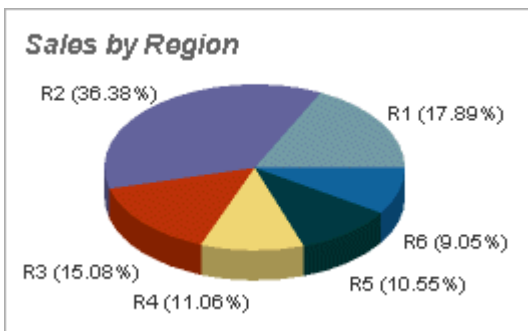


Line Graph: Line graphs compare two variables. Each variable is plotted along an **axis**. A line graph has a vertical axis and a horizontal axis. So, for example, if you wanted to graph the height of a ball after you have thrown it, you could put time along the horizontal, or x-axis,

and height along the vertical, or y-axis.



Pie Chart: Pie charts, or circle graphs as they are sometimes known, are very different from the other three types of graphs that we've looked at. They don't use a set of axes to plot points. In addition, they don't work with the same type of data that the other three work with. Pie charts are display **percentages**. Therefore, they are used to compare different parts of the same whole.



1. Divide into partners or groups of three. Develop a survey question that you would like to ask your fellow third grade students. Also, develop between 3-5 answers to that question in addition to the choice of "other".
2. Use Microsoft Excel to create a table to collect your data. (Go to "Table" tab and "insert"). The table should include a space to

- put the date the data was collected and other information about the person surveyed (race, grade level, age, etc).
3. Collect data at various appropriate times during the day. Recess is a wonderful opportunity. (2-3 days).
  4. After you have collected your data, create line plots that represent your data. Review the pizza line plot created by the class at the beginning of the unit. Can you point out important components such as x-axis and y-axis, list of choices along the x-axis, title of graph, labels of axis, and a key? Remember that one picture/symbol can represent more than one person but must represent the same amount of people and the graph must contain a KEY.

**Review this web site for help in creating graphs with Excel:**

- [http://www.Internet4classrooms.com/Excel\\_create\\_chart.htm](http://www.Internet4classrooms.com/Excel_create_chart.htm)

Let's look at bar graphs now. Use the pizza data from the beginning of the unit to create a bar graph as a class. Remember the important components including the x and y axis, how you label the x-axis with the choices and label the y-axis with the number of people. title of graph, and how to fill in squares on graph paper. Remember how you can number the axis using skip counting (2/4/6/8 or 5/10/15/20) depending on the number of responses to the survey. Leave the bar graph displayed while you are working in your groups.

Using Excel and your current table of survey results create a bar graph. Save or Print out your graph for your teacher.

Now, use the pizza data in order to create a pie chart. Use your circle cutouts of different colors to represent the different choices (example: red represents pepperoni). Each circle can represent one person. Estimate the center of the large circle, mark it and then use a ruler to draw a line from the center of the circle to the outside edges of each color creating a circle graph. Now place your favorite type of pizza in the appropriate space. When everyone is finished, label the chart and remember the graph must contain a key. Now, using your survey data, utilize the Excel program to create a Pie Chart of your results. Save or Print out your graph for your teacher.

## **Explain**

### **Explain**

Your group will prepare a short presentation using Microsoft PowerPoint that explains your survey, how you collected data, the types of people you surveyed, and your three visual examples of the data. Explain what you learned about your school community based on your survey. Keep in mind these types of questions:

- 1) What was the most popular answer?
- 2) What was the least popular answer?
- 3) How many people like one choice more than another?
- 4) What type of population was surveyed?

You may want to review the information presented on Nortel LearniT for help in creating your multimedia presentation.

PowerPoint Presentations,  
[http://nortellearnit.org/technology/PowerPoint\\_Presentations/](http://nortellearnit.org/technology/PowerPoint_Presentations/)

You may also want to review the information presented below about creating and presenting your PowerPoint.

## PowerPoint Presentation Task Cards

### Step 1 – Conduct Research

Collect the information you will need for your presentation using the Internet. Remember to reference the source of all information as you collect it. (Much easier than trying to find it later!)



**Videos:** Visit [www.NortelLearnIT.org](http://www.NortelLearnIT.org), select **Discovering the Internet**, and watch Better Searches, Credibility, and Search Engines. It would be a good idea to watch these **Digital Ethics** videos too: Copyright and Fair Use.

### Step 2 – Create your storyboard

Using the template provided, create your storyboard. Include the main points and flow of your presentation.

Tip: If you need to reorder your slides while planning, get out some scissors, cut up your storyboard and paste it back together.

After you have completed your storyboard watch the following **videos**: visit [www.NortelLearnIT.org](http://www.NortelLearnIT.org), select **PowerPoint Presentations**, and watch Basics and Project: Introduction.

### Step 3 – Learn about PowerPoint

Spend some time becoming familiar with basic and more advanced features of PowerPoint. Open a blank presentation and practice as you work through the videos. This is just for practice – have fun!

**Videos:** Visit [www.NortelLearnIT.org](http://www.NortelLearnIT.org), select **PowerPoint Presentations**, and watch Project: Part One, Text, Bullets and Numbering and Clip Art.

## Step 4 – Create Slides

Now that your research is complete, you have a plan, and have become more familiar with PowerPoint it is time to create. Choose the design, font and colors for your presentation. Create the first three (3) slides.

Add text on these slides.

Remember that you should only include talking points on your slides. Slides are not meant to be read by you or your audience. Five points per slide is a good guideline.

**Videos:** Visit [www.NortelLearnIT.org](http://www.NortelLearnIT.org), select **PowerPoint Presentations**, and watch Templates and Wizards and Master Slides.

## Step 5 – Create Slides (cont'd)

Add remaining slides (there is no set amount, use as many as you need).

Proofread your text. Does the order and flow of information make sense?

Add transitions between your slides.

**Videos:** Visit [www.NortelLearnIT.org](http://www.NortelLearnIT.org), select **PowerPoint Presentations**, and watch Transitions.

## Step 6 – Images, Animations and Testing

Add images, animations and action buttons as needed.

Label and describe your images and pictures.

Add any remaining text.

Reference the source of text and images where appropriate.

Spell check and proofread all content. Test your slideshow.

Practice for your presentation.

**Video:** Visit [www.NortelLearnIT.org](http://www.NortelLearnIT.org), select **PowerPoint Presentations**, watch Animation and Presenting.



**Next Step: Presentations. Good Luck!**

## **Elaborate**

### **Elaborate**

Using Microsoft Word, create a worksheet for your classmates. Develop 5-7 questions about your data and visual representations that your classmates should be able to answer by looking at your work. Don't forget the answer key your teacher needs to grade answers.

## Evaluate

### Evaluate

You will view other groups' data and answer questions about the data represented. Your answer to the questions posed by other groups will be graded to help determine your ability to read the graph. The groups will be graded using the rubric listed below for the presentations and readability of your graphs.

Criteria	Unsatisfactory	Needs Improvement	Satisfactory	Exemplary
<b>Research</b>	Limited research, from limited sources	Somewhat well researched from somewhat varied sources.	Well researched, from various sources	Thorough research from varied sources presenting different points of view
<b>Storyboard / planning</b>	Limited planning evident	Some planning evident	Planning evident	Thorough planning evident
<b>Content</b>	Lacks detail	Some detail	Good detail	Excellent detail
<b>Technology Use to Demonstrate Understanding</b>	Technology use with little purpose	Technology use with some purpose	Technology use with purpose	Intuitive technology use with specific purpose
<b>Overall Final Project</b>	Inconsistent and inappropriate aesthetics and technical functionality	Somewhat consistent and appropriate aesthetics and technical functionality	Consistent and appropriate aesthetics and technical functionality	Consistent, creative and appropriate aesthetics and technical functionality

## **Extend**

### **Extend**

Consider these suggestions for extending this lesson.

1. Graph of the Day: Each day present a different graph and discuss the components of the graph and discuss what the graph represents and how we know.
2. Complete your surveys in the community, create visual representations and then compare the data you gathered in the community to the data you gathered while confined to your school community. Explore how different types of people (age, race, etc.) responded to the question posed and how different sub-groups responded to the question.
3. Using the lesson plan, All About Me, located on the Nortel LearnIT site, create graphs based upon the similarities and differences of students.

### **Related Resources**

Important Web Sites:

[http://www.Internet4classrooms.com/Excel\\_create\\_chart.htm](http://www.Internet4classrooms.com/Excel_create_chart.htm)

<http://nces.ed.gov/nceskids/createagraph/default.aspx>: Internet tool that helps students create graphs on the web

<http://www.mste.uiuc.edu/courses/ci330ms/youtsey/intro.html>

[http://spreadsheets.about.com/od/spreadsheetlessons/ss/Excel\\_graph\\_use\\_2.htm](http://spreadsheets.about.com/od/spreadsheetlessons/ss/Excel_graph_use_2.htm)

<http://www.beaconlearningcenter.com/WebLessons/KindsOfGraphs/default.htm>

