



Unit Map 2010-2011

The Judge Charles J. Vallone School

Sullivan, Debbie / Math MS / Middle School (Demo Middle School)



Unit: Problem-solving and Data Analysis-Grade 8 (Week 5, 4 Weeks)

Big Ideas

Classification and organization of data provides information for correct predictions and justifications. Mathematicians create appropriate displays of data such as box-and-whisker plots, scatterplots, and stem-and-leaf plots to analyze and interpret data.

Essential Questions

How can I classify and organize data to support my predictions and justifications?
How do I determine what type of graph to use to explain my predictions and justifications?

Common Core Standards and Indicators

Math (2005), 8th Grade , Problem Solving

Students will solve problems that arise in mathematics and in other contexts.

- 8.PS.5 Make conjectures from generalizations
- 8.PS.6 Represent problem situations verbally, numerically, algebraically, and graphically

Students will monitor and reflect on the process of mathematical problem solving.

- 8.PS.15 Choose methods for obtaining required information

Math (2005), 8th Grade , Representation

Students will create and use representations to organize, record, and communicate mathematical ideas.

- 8.R.1 Use physical objects, drawings, charts, tables, graphs, symbols, equations, or objects created using technology as representations
- 8.R.2 Explain, describe, and defend mathematical ideas using representations

CCSS: Mathematics, CCSS: Grade 8, Expressions & Equations

8.EE Understand the connections between proportional relationships, lines, and linear equations.

- 5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to

determine which of two moving objects has greater speed.

CCSS: Mathematics, CCSS: Grade 8, Statistics & Probability

8.SP Investigate patterns of association in bivariate data.

- 1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
- 4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

Content

- Classification and organization of data
- Validity of statistical conclusions
- Range
- Mean, Median, Mode
- Measures of central tendency
- Types of data displays
 - histogram
 - scatter plot
 - box-whisker

Skills / Strategies

- Organize data using either histograms, scatter plots, or box and whisker plots
- Display data using either histograms, scatter plots, or box and whisker plots
- Interpret information from a variety of data displays
- Determine and explain whether statistical conclusions are correct
- Explain why range, mean, median, or mode is the best choice to examine data
- Demonstrate critical thinking, communication, and collaboration skills in using data analysis with problem solving

Key Terms / Vocabulary

range, mean, median, mode, central tendency, histogram, scatter plot

Assessments

**Summative Assessment
Exhibition**

Independently or in small groups, students research five different types of graphs through means of their choosing (internet, magazines, newspaper, ball cards). Students will design a visual as well as an explanation of each graph chosen elaborating on how

it was used and why they think that particular graph was utilized.

Formative Assessment

Personal Project

Create two displays using graphs - explain both orally and written how they are different and similar. Explanation should justify why the two graphs were selected, reflect and analyze how the data is displayed, and make connections to real world situations. Students should be able to communicate effectively both orally and written evaluations.

Activities

- Brainstorm ways in which we use data in the 21st century and how it impacts students' lives. Have students choose 1 of the gathered items or find their own. Write an short essay supporting the importance of using this data and the impact it has on us as a society. How can they use they interpret the information, draw conclusions, and make judgements using this data? See attached.
- In cooperative groups, create a graph based on information gathered from a survey. In written form, explain why the graph was chosen and share results.
- Have students work together in groups to work through "Bears in a Boat" to create a box and whiskers plot -  <http://illuminations.nctm.org/LessonDetail.aspx?id=L856>
- Have students work together in groups to collect data on breathing. See attached. Have them prepare a graph on chart paper or other media to share with class justifying reasons for choosing their graphing choice.  <http://illuminations.nctm.org/LessonDetail.aspx?ID=L243>
- Use battery operated small trucks to gather data. See attached.
- Explain in writing a step by step process of how to create a scatter-plot graph beginning with collection data. Students will exchange step by step process and complete the graph using those directions.

 [Use math is fun website to practice/create different graphs](#)

 [Collecting data by using cars](#)

 [Collecting data by counting times you breathe](#)

 [Beginning of a list of data in our lives](#)

Resources

- *A Collection of Performance Tasks and Rubrics* - Charlotte Danielson
- Use of videos on data and graphing; see attached. With each video, have students take notes, documenting at least 5 concepts new to them gathered in video. Have students "Pair Share" these concepts within small groups. Lead a discussion in what concept(s) was noted the most in each group.
- Websites

-  [Teacher Resource site](#)
-  [A variety of math resources for teachers and students](#)
-  [Video on representing data and different graphs](#)
-  [Video on preparing data and displaying it](#)
-  [Many lessons and activities for data and graphing](#)

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