Chapter 21. Developing Concepts of data Analysis

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| **Representative TN State Curriculum Standards**  3rd Grade:  GLE 0306.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.  GLE 0306.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.  GLE 0306.5.1 Organize, display, and analyze data using various representations to solve problems.  SPI 0306.1.5 Represent problems mathematically using diagrams, numbers, and symbolic expressions.  SPI 0306.1.8 Express answers clearly in verbal, numerical, or graphical (bar and picture) form, using units when appropriate.  SPI 0306.5.1 Interpret a frequency table, bar graph, pictograph, or line plot.  SPI 0306.5.2 Solve problems in which data is represented in tables or graph.  SPI 0306.5.3 Make predictions based on various representations of data.  4th Grade:  GLE 0406.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions.  GLE 0406.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts.  GLE 0406.5.1 Collect, record, arrange, present, and interpret data using tables and various representations  SPI 0406.5.1 Depict data using various representations (e.g., tables, pictographs, line graphs, bar graphs).    SPI 0406.5.3 Given a set of data or a graph, describe the distribution of the data using median, range, or mode. | |
| frogandtoadarefriends2e.jpg | Time: 8 Minutes  This read aloud is designed to teach students about the processes of collecting and sorting data. While listening to the short story, *A Lost Button,* students will actively listen, as well as, take notes about the buttons that Frog and Toad find. Following the story, students will be asked to look at and classify the buttons in categories.   * Introducing data collection and classification * Introducing graphs, specifically the Venn Diagram |

**Virtual Manipulatives-8 Minutes**

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| ***Cyberchase-*** <http://pbskids.org/cyberchase/math-games/bugs-in-the-system/>  **Game: Bugs in the System**  Objective: The “cybrary” has been infested with bugs, and it is up to the player to remove all bugs from the “cybrary” by placing them in the bar graph. Throughout each phase, players are asked questions regarding the quantity of bugs in the bar graph to assess understanding.  ***Data Handling-*** <http://www.bbc.co.uk/education/mathsfile/gameswheel.html>  **Game: Picking Data**  Objective: Player gathers data from the students listed in the class photo, places the information in a tally chart, then selects the circle graph that corresponds with the collected data. |
| ***Interactivate-*** <http://www.shodor.org/interactivate/activities/PlopIt/>  **Plop It!**  Objective: In this interactive manipulative, students record data in a bar graph, then are shown the mean, median, and mode that are calculated from their data. Students can also continue to add in or take away data, as well as move the data around to see how these processes can change the measures of central tendency. |

**Activities from the Textbook**

**Materials Needed:** Ribbon, Hundredths disk (Blackline master 28), Connecting cubes, Construction paper, Rulers, Tape, M&M’s,

1. Activity 21.2- Guess My Rule. Pg. 442; 5 Minutes
   1. Topic: Collecting Data and sorting attributes by values.
2. Easily Made Circle Graphs. Pg. 445; 5 Minutes
   1. Topic: A kinesthetic and visual representation of how a circle graph is created, as well as the way the ratios are divided out.
3. Activity 21.5- Leveling the Bars. Pg. 450; 5 Minutes
   1. Topic: Students use connecting cubes to make a “bar graph” then level out the bars to find the mean.
4. Activity 21.6- The Mean Foot. Pg. 450; 5 Minutes
   1. Topic: Students use strips of paper to measure their foot, and then combine their measurements in small groups and eventually whole class to find the mean or average size of the class’s foot.

**Additional Activity- 7 Minutes**

3-D Candy Pictograph from “Great Graphs and Sensational Statistics” by Lynette Long.

Pg. 8-10; 5 Minutes

1. Topic: Students will use a premade graph to measure the number of different colored M&M’s in a package. Once each student has made a graph, we will then make a class graph (using the Mode from each personal graph).
   1. Additional notes: If a student has more than one mode, they can simply choose their favorite color.
   2. Some adjustments have been made to the original lesson to best fit the class setting.

**Lesson Plan-2 Minutes**

Food Court

<http://illuminations.nctm.org/LessonDetail.aspx?id=U149>

This lesson plan is constructed as a unit and spread over four lessons. Within these lessons, students conduct surveys, collect data, and represent the data in various different ways. Students also take the opportunity to explore measures of central tendency while interacting with their classmates in a real-world, real-life situation.