

Unit Title: “Data About Us”

Course: Middle School Mathematics

Subject Area: Mathematics

Time Frame: 20 days

Standards

Middle School Mathematics Standards	Sunshine State Standards Benchmarks	NCEE New Standards
<p>The student will:</p> <p>2.1 Explore the process of data investigation, such as posing questions, collecting data, analyzing data, and making interpretations to answer questions.</p> <p>2.2 Represent data using line graphs, bar graphs, stem-and-leaf plots, and coordinate graphs.</p> <p>2.3 Explore ways of describing data such as measures of center (mode, median, mean) and range or variability in the data.</p> <p>2.4 Develop strategies for comparing data sets.</p>	<p>MA.E.1.3.1 The student collects, organizes, and displays data in a variety of forms, including tables, line graphs, charts, bar graphs, to determine how different ways of representing data can lead to different interpretations.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none">• Reads and analyzes data displayed in a variety of forms (charts, pictographs, stem-and-leaf plots).• Generates and collects data for analysis.• Chooses appropriate titles, scales, labels, keys, and intervals for displaying data in graphs.• Constructs, interprets, and explains display of data, such as tables and graphs (single- and multi-bar graphs and single- and multi-line graphs).	<p>The student:</p> <p>M4a Collects data, organizes data, and displays data with tables, charts, and graphs that are appropriate, i.e., consistent with the nature of the data.</p> <p>M4b Analyzes data with respect of characteristics to frequency and distribution, including mode and range.</p> <p>M4c Analyzes appropriate central tendencies of data by considering mean and median.</p>

Middle School Mathematics Standards	Sunshine State Standards Benchmarks	NCEE New Standards
	<p>MA.E.1.3.2 The student understands and applies the concepts of range and central tendency (mean, median, and mode).</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Organizes items in a set of data. • Find the range, mean, median, and mode of a set of data. • Describe real-world data by applying and explaining appropriate procedures for finding measures of central tendency. <p>MA.E.1.3.3 The student analyzes real-world data by applying appropriate formulas for measures of central tendency and organizing data in a quality display, using appropriate technology, including calculators and computers.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Describes a set of data by using the measures of central tendency. • Uses technology, such as graphing calculators and computer spreadsheets, to create graphs. 	

Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
<p>Students will understand</p> <ul style="list-style-type: none"> • Exploring statistics is a dynamic process of data investigations that involves moving back and forth among four interconnected components: <ul style="list-style-type: none"> ○ Posing the question; ○ Collecting the data; ○ Analyzing the data; and ○ Interpreting the results. • Reading data using graphs <ul style="list-style-type: none"> ○ Involves “lifting” information from a graph to answer explicit questions; ○ Includes the interpretation and integration of information presented in a graph; and ○ Involves extending, predicting, or inferring from data to answer implicit questions. 	<ul style="list-style-type: none"> • How can mathematics be used to describe data? • What are some of the techniques for describing a set of data? • How can data be studied by using tables, graphs, or line plots? How can one determine which of these is most useful in a given situation? • Why are data pairs needed in order to draw a coordinate graph? • What information can one get from a coordinate graph? What kind of relationship can be seen in a coordinate graph? • How can an average value be found by using models? How can it be found mathematically? 	<p>Students will know</p> <ul style="list-style-type: none"> • Key terms (e.g., axis, axes, bar graph, categorical data, coordinate graph (scatter plot), data, line plot, mean, median, mode, numerical data, outlier, range, scale, stem-and-leaf plot, survey, table) • The process of data investigation: posing questions, collecting data, analyzing data, and making interpretations to answer questions. <p>Students will be able to</p> <ul style="list-style-type: none"> • Engage in the process of data investigation: posing question, collecting data, analyzing data, and making interpretations to answer equations. • Represent data using line plots, bar graphs, stem-and-leaf plots, and coordinates graphs. • Explore concepts that relate to ways of describing data, such as the shape of a distribution, what’s typical in the data, measures of center (mode, median, mean) and range or variability in the data. • Develop a variety of strategies for comparing data sets.

Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> • Looking at Data Students consider the lengths of names, which leads to an investigation of the distribution of numbers of letters in names. They are introduced to or review the use of tables, line plots, and bar graphs to represent data; ways to describe the shape of a distribution; and the use of two measures of center (the mode and median) and a measure of spread (the range) that can be used to characterize a distribution. • Types of Data Students focus on categorical and numerical data. Two problems give students further experience with working with the two types of data. • Using Graphs to Group Data Students are introduced to the stem-and-leaf plots as a strategy for grouping and displaying data in intervals. • Coordinate Graphs Student use coordinate graphs to display pairs of data. They begin by collecting data about the lengths of their arm spans and their heights; using these data, they make a coordinate graph and sketch in the $y = x$ line so they can discuss people who are above, on, or below the line and what this means in terms of their own arm spans and heights. • What Do We Mean by <i>Mean</i>? This investigation focuses on developing the concept of <i>mean</i>. The “average” number of people in the families of students in the class provides the setting. The notion of “evening out” or “balancing” the distribution at a point (the mean) located on the horizontal axis is modeled by using cubes and stick-on notes. The models support the algorithm for finding the mean. 	<p>Check-Up 1 Quiz A Check-Up 2 Quiz B Unit Test</p>	<p>Teacher observations of students during work on performance tasks. Accountable talk during work on performance tasks.</p>