Unit 4 - *"Fact or Fiction?" Statistics*

Overview

Building on, and reinforcing their understanding of number, students begin to develop their ability to think statistically. First, they learn what makes a good statistical question. Students recognize that different ways to measure center yield different values. Students recognize that a measure of variability can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected. Although the students will be creating data displays, throughout the unit, the emphasis should be on the student reading, understanding and critically reflecting on displayed data.

21st Century Capacities: Presentation and Synthesizing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS	*Transfer:*
MP3 Construct viable arguments and critique the reasoning of others MP4 Model with Mathematics MP6 Attend to precision MP7 Look for and make use of structure	Students will be able to independently use their learning in new situations to... 1. Communicate important information, to convince an audience, using sound mathematical reasoning.. (Presentation) 2. Describe a data set using statistics to draw conclusion. (Synthesizing)

Meaning:

UNDERSTANDINGS: *Students will understand that:*	ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*
CC.6.SP.1- Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages. CC.6.SP.2- Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	1. Different statistics illuminate different patterns of the same data 2. Individual data points can dramatically affect data patterns 3. Mathematicians select and use appropriate statistical methods and tools to analyze data, show trends, evaluate inference and/or describe or make predictions.	A. How can statistics help us make decisions? B. What is the best way to describe this data? C. How do visual representations of data help us understand the data?

	Acquisition:	
CC.6.SP.3- Recognize that a measure of center for a numerical data set summarizes all of its values using a single number, while a measure of variation describes how its values vary using a single number. CC.6.SP.4- Display numerical data in plots on a number line, including dot plots, histograms, and box plots. CC.6.SP.5a- Reporting the number of observations CC.6.SP.5b- Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. CC.6.SP.5c- Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data was gathered. CC.6.SP.5d- Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data was gathered.	*Students will know…* 1. That a statistical question is answerable by various measurable values 2. That responses to a statistical question can be shared and interpreted by its center, spread and shape 3. How to represent data on various types of graphs, charts, including creating scales and showing relationships 4. How different statistics, charts and graphs serve the purpose of accurately representing data and sharing specific attributes 5. How to interpret data, trends and measures of central tendency from statistics, charts and graphs 6. How data can be intentionally or unintentionally misleading and how to avoid being swayed by misleading representations of data 7. Outliers can affect measures of central tendencies 8. Vocabulary: Mean, Median, Mode, Range, Tally Chart, Frequency Chart, Number Line, Dot Plot, Histogram, Box Plot, Interquartile Range, Mean Absolute Deviation, Stem and Leaf Diagram	*Students will be skilled at…* 1. Identifying and writing statistical questions 2. Finding Mean, Median, Mode and Range 3. Collecting and sharing data on number lines, dot plots, histograms and boxplots and tally/frequency charts, 4. Including key components when creating charts and graphs from data 5. Interpreting data from statistics, charts and graphs 6. Identifying misleading data 7. Identifying and interpreting outliers