

## HPISD Seventh Grade 7/8 Math

UNIT NAME	ESTIMATED DURATION	9 WEEKS			
<b>UNIT 1: DATA AND PROBABILITY</b> <b>MODULE 1: REPRESENTING DATA</b>	<b>8 DAYS</b>	<b>1</b>	2	3	4
<b>Unit Overview</b>					
The student applies mathematical process standards to use probability and statistics to describe or solve problems involving proportional relationships and use statistical representations to analyze data. The student applies mathematical process standards to use numerical or graphical representations to analyze and solve problems.					
<b>Enduring Understandings</b>					
The student will understand that:	<ul style="list-style-type: none"> <li>• Data is represented, compared, and interpreted using graphs.</li> <li>• Graphical representations show distribution of values and can be analyzed to draw conclusions.</li> <li>• Graphical representations can be used to make predictions about a population.</li> <li>• Statistical representations make distinction between situations and summarize data.</li> <li>• Data from random samples can represent a population.</li> </ul>				
<b>Concepts</b>					
Measures of Center	Measure used to describe the middle of a data set; the mean, median, and mode are measures of central tendency				
Graph	Visual representation showing the relation between variable quantities				
Statistical Question	Question that has many different, or variable, answers				
Populations	The number of cubic units needed to fill a given space				
Numeric Data	Data that can be measured or identified on a numerical scale				
Range	Difference of the greatest value and the least value in a data set				
Sample	Part of the population that is chosen to represent the entire group				
Outliers	Data values that are either much greater or much less than the other data values				
Categorical Data	Data that are sorted into categories on the basis of qualitative characteristics				
Interquartile Range	Difference of the third (upper) and first (lower) quartiles in a data set, representing the middle half of the data				
Measures of Spread	Measure that describes how far apart the data are distributed				
<b>Guiding/Essential Questions</b>					
<ul style="list-style-type: none"> <li>• How can you use measures of center to describe a data set?</li> <li>• How can you use a box plots and measures of spread to describe a data set?</li> <li>• How can you summarize and display numeric data?</li> <li>• How can you solve real-world problems by displaying, analyzing, and summarizing data?</li> </ul>					

- How can you summarize and display categorical data?
- How do you use proportional reasoning to solve problems involving graphs of data?
- How can you use a sample to gain information about a population?
- How can you use random samples to compare two populations?

### Learning Targets and Progressions

- **Students will represent numeric data graphically and use the graphical representation to describe the measures of spread.**
  - Summarize numeric data using mean, median, and mode (measures of center) and the range and IQR (measures of spread)
  - Use the summaries of center, spread, and shape to describe a data set
  - Display data using the appropriate graph
- **Students will apply summary statistics to describe numeric and categorical data and make comparisons.**
  - Draw conclusions from a data set using measures of dispersion: variance, standard deviation, or interquartile range
  - Compare and contrast data from graphs based on measures of central tendency: mean, median, and mode
  - Interpret sets of data in various graphical representations to make distinctions regarding measures of variability
- **Students will make predictions using proportional reasoning regarding populations.**
  - Compare two populations based on data in random samples and make inferences about differences between the two populations
  - Use data from random sample to make inferences about a population
- **Students will approximate the trend line of a scatterplot and use the information to make predictions.**
  - Use bivariate sets of data to create a scatterplot representation.
  - Describe the relationship of the data as having a positive, negative or no association.

### Formative Assessments

### Summative Assessments

### TEKS: Readiness Standards

**7.12A** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads.

**8.5D** Use a trend line that approximates the linear relationship between bivariate sets of data to make predictions.

### TEKS: Supporting Standards

**7.12B** use data from a random sample to make inferences about a population

**7.12C** compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations

**8.5C** Contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation.

**8.11A** Construct a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data.

**8.11B** Determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points.

**8.11C** Simulate generating random samples of the same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which it was selected.

## TEKS Process Standards

**7.1A/8.1A** apply mathematics to problems arising in everyday life, society, and the workplace

**7.1B/8.1B** use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution

**7.1C/8.1C** select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems

**7.1D/8.1D** communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate

**7.1E/8.1E** create and use representations to organize, record and communicate mathematical ideas

**7.1F/8.1F** analyze mathematical relationships to connect and communicate mathematical ideas

**7.1G/8.1G** display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

### Processes and Skills:

#### What students should be able to DO

- Display numeric data graphically
- Analyze graphical representations to describe distribution
- Summarize numeric and categorical data including quantitative and qualitative measures
- Make interpretations based on sets of data
- Distinguish the variability between situations
- Apply inferences from a random sample to make predictions about a whole population
- Make comparisons between populations
- Make a scatterplot from bivariate data
- Create and extend a trend line in a scatterplot

### Facts:

#### What students should KNOW

- Types of graphs and their purpose
- Measures of Center (mean, median, and mode)
- Difference between numeric and categorical data
- Measures of Spread (range and interquartile range)
- Difference between sample and population

## Topics

Analyzing Categorical Data  
 Box Plots  
 Categorical Data  
 Circle Graph  
 Comparing Data Displayed in Box Plots  
 Comparing Data Displayed in Dot Plots  
 Comparing Populations  
 Dot Plots  
 Inferences from Samples

Interquartile Range  
 Measures of Center  
 Measures of Spread  
 Outliers  
 Populations  
 Relative Frequency  
 Sample (random and biased)  
 Statistical Questions  
 Trend Lines  
 Scatterplots

## Language of Instruction

bar graphs  
 biased sample

measures of spread  
 median

box plots categorical data center circle graphs comparisons data distribution dot plots interquartile range line graphs mean measures of center	mode numeric data outliers populations predict based on sample random sample range sample shape of distribution trend lines scatterplots
<b>State Assessment Connections</b>	<b>National Assessment Connections</b>
<b>Resources</b>	
HMH <u>Texas Go Math!</u> Grade 6 Pages 479-521  HMH <u>Texas Go Math!</u> Grade 7 Pages 343-397	