Instructional Focus Document
Grade 7 Mathematics

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

UNIT OVERVIEW

Introduction

This unit bundles student expectations that address the data representations of numerical and categorical data including comparisons and inferences to solve problems. According to the Texas Education Agency, mathematical process standards including application, a problem-solving model, tools and techniques, communication, representations, relationships, and justifications should be integrated (when applicable) with content knowledge and skills so that students are prepared to use mathematics in everyday life, society, and the workplace. The introduction to the grade level standards state, "While the use of all types of technology is important, the emphasis on algebra readiness skills necessitates the implementation of graphing technology."

Prior to this Unit

In Grade 6, students represented numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots. Students used graphical representation of numeric data to describe the center, spread, and shape of the data distribution. Students summarized numeric data with numerical summaries, including the mean, median, range and interquartile range. Students also summarized categorical data with numerical and graphical summaries, including the mode, the percent of values in each category, and the percent bar graph and used these summaries to describe the data distribution. In previous grades, students represented data with pictographs, bar graphs, frequency tables, dot plots, stem-and-leaf plots, scatterplots, histograms, box plots, relative frequency tables, and percent bar graphs. In Grade 5, students balanced a simple budget.

During this Unit

Students solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents. Students use data from random samples to make inferences about a population and compare two populations based on data from random samples, including informal comparative inferences about differences between the two populations. Students consider the strength of the inference based on the relative size of the sample compared to the total population. Students compare two groups of numeric data using comparative dot plots or box plots by describing their shapes, centers, and spreads. Descriptions of shape, center, and spread include skewed right, skewed left, symmetrical, mean, median, mode, range, and interquartile range. Percents are also incorporated within this unit as students calculate the components of a personal budget in conjunction with circle graphs and bar graphs.

Other considerations: Reference the Mathematics Grade 7 Instructional Considerations to Activate Purposeful Planning (ICAPP) Resource.

After this Unit

In Grade 8, students will 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. Students will also 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.

Additional Notes

In Grade 7, comparing two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads is identified as STAAR Readiness Standard 7.12A. Using data from a random sample to make inferences about a population (7.12B), comparing two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations (7.12C) are STAAR Supporting Standards 7.12B and 7.12C. These three

standards are part of the Grade 7 *Texas Response to Curriculum Focal Points* (TxRCFP): Comparing sets of data. Solving problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents is STAAR Readiness Standard 7.6G and part of the Grade 7 Focal Point: Representing and applying proportional relationships (TxRCFP). Identifying the components of a personal budget and calculating what percentage each category comprises of the total budget is STAAR Supporting Standard 7.13B and subsumed within the Grade 7 Focal Point: Financial Literacy (TxRCFP). All of the standards in this unit are listed under the Grade 7 STAAR Reporting Category 4: Data Analysis and Personal Financial Literacy. This unit is supporting the development of the *Texas College and Career Readiness Standards* (TxCCRS): I. Numeric Reasoning A2, B1; II. Algebraic Reasoning D1, D2; V. Statistical Reasoning B3, C1, C3; VII. Problem Solving and Reasoning A1, A2, A3, A4, A5, B1, C1, D1, D2; VIII. Communication and Representation A1, A2, A3, B1, B2, C1, C2, C3; IX. Connections A1, A2, B1, B2, B3.

Research

According to the National Council of Teachers of Mathematics (NCTM), *Principles and Standards for School Mathematics* (2000), “Students should consider how well different graphs represent important characteristics of data sets. For example, they might notice that it is easier to see symmetry or skewness in a graph than in a table of values. Box plots can provide effective comparisons between data sets because they make descriptive characteristics such as median and interquartile range readily apparent” (p. 251). Research from Gale and Levine (2011) that summarizes a study from the National Endowment of Financial Education that surveyed individuals about their financial literacy attained prior to entering college suggests that “respondents who were in a state with mandated financial education generally had higher financial literacy scores, as well as “better” financial behaviors including budgeting and use of credit” (p.10). Integrating financial literacy concepts within the curriculum as an extension of learning within a unit, allows for a variety of problem situations and contexts to deepen mathematical understandings.

Gale, W. G., Levine, R. (2011). *Financial literacy: what works? How could it be more effective?* Boston, MA: Financial Security Project at Boston College.
National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics.* Reston, VA: National Council of Teachers of Mathematics, Inc.
Texas Education Agency & Texas Higher Education Coordinating Board. (2009). *Texas college and career readiness standards.* Retrieved from http://www.thecb.state.tx.us/institutional-resources-programs/public-community-technical-state-colleges/texas-college-and-career-readiness-standards/
Texas Education Agency. (2013). *Texas response to curriculum focal points for kindergarten through grade 8 mathematics.* Retrieved from https://www.texasgateway.org/resource/txrcfp-texas-response-curriculum-focal-points-k-8-mathematics-revised-2013

OVERARCHING UNDERSTANDINGS AND QUESTIONS

Instructional Focus Document
Grade 7 Mathematics

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

Quantitative relationships model problem situations efficiently and can be used to make generalizations, predictions, and critical judgements in everyday life.

- What patterns exist within different types of quantitative relationships and where are they found in everyday life?
- Why is the ability to model quantitative relationships in a variety of ways essential to solving problems in everyday life?

Financial and economic knowledge leads to informed and rational decisions allowing for effective management of financial resources when planning for a lifetime of financial security.

- Why is financial stability important in everyday life?
- What economic and financial knowledge is critical for planning for a lifetime of financial security?
- How can mapping one's financial future lead to significant short and long-term benefits?
- How can current financial and economic factors in everyday life impact daily decisions and future opportunities?

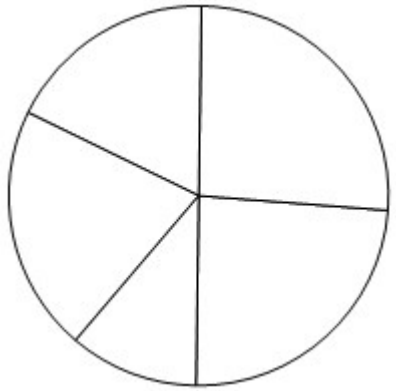
UNIT UNDERSTANDINGS AND QUESTIONS	OVERARCHING CONCEPTS AND UNIT CONCEPTS	PERFORMANCE ASSESSMENT(S)

Understanding how two quantities vary together (covariation) and can be reasoned up and down in situations involving invariant (constant) relationships builds flexible proportional reasoning in order to make predictions and critical judgements about the relationship.
• Statistical displays represent proportional relationships that can be analyzed to inform understandings, influence decisions, make predictions, and solve problems in everyday life.
	Proportionality
	• Statistics
	  • Predictions, comparisons, and inferences
	  • Data
	  • Statistical representations
	• Fractions and Decimals
	  • Percents
	• Representations
	• Solution Strategies
		Mathematics Grade 7 Unit 09 PA 01
		Click on the PA title to view related rubric.
		
		Analyze the problem situation(s) described below. Organize and record your work for each of the following tasks. Using precise mathematical language, justify and explain each solution process.
		
		Based on a monthly income, George has represented his

Instructional Focus Document
Grade 7 Mathematics

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

UNIT UNDERSTANDINGS AND QUESTIONS	OVERARCHING CONCEPTS AND UNIT CONCEPTS	PERFORMANCE ASSESSMENT(S)

• How are category values determined if the percent of each category is given?
• How are category percents determined if the values of each category is given?
• How can proportions be used to solve problems involving percents?
• How are proportional relationships modeled in a …
  ◦ bar graph?
  ◦ dot plot?
  ◦ circle graph?
• What are …
  ◦ part-to-part comparisons
  ◦ part-to-whole comparisons
  … in a …
  ◦ bar graph?
  ◦ dot plot?
  ◦ circle graph?
• What adjustments should be made to maintain the part-to-part and part-to-whole comparisons?
 	
Understanding components of a personal budget and how percentages of each category comprises the total budget helps one make informed financial management decisions, which promotes a more secured financial future.
• Why are budgets often displayed in a bar graph or circle graph?
• Why are categories in budgets represented with values
	Personal Financial Literacy
	• Budgets
	• College
	  • Cost
	  • Payment options
	  • Savings plans
	• Emergencies
	• Expenses
	  • Fixed
	  • Variable
	• Financial Responsibility
	• Income
	• Retirement
	• Savings
	• Taxes
	
	<u>Associated Mathematical Processes</u>
	• Application
	• Problem Solving Model
	• Tools and Techniques
	• Communication
	• Representations
	• Relationships
	• Justification
		budget in the table shown below.
		
		Category / Percent
		Savings 24%
		Rent 26%
		Groceries 18%
		Household bills 21%
		Entertainment/Clothing 11%
		
		1. George's monthly income is $3,890.
		  a. Use the data represented in the table to label the circle graph with the appropriate category label and percent and the dollar amount in each category of the budget.
		 
		2. George's rent was increased by $97.25. Since George's monthly income will not change,

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

UNIT UNDERSTANDINGS AND QUESTIONS	OVERARCHING CONCEPTS AND UNIT CONCEPTS	PERFORMANCE ASSESSMENT(S)
and percents? • How does income affect a budget? • What are the components of a personal budget? • What are fixed and variables expenses, and how are they represented in a budget? • Why should retirement, college, taxes, and emergencies always be included in a budget? • What is the process to determine the percentage of each category that comprise a total budget? • How is a simple budget balanced, and why is it important to maintain a balanced budget? • How is the total budget effected when one component … ◦ increases? ◦ decreases? • What are the effects of the other categories in a personal budget when the amount in one category increases and the total budget remains the same? • How does understanding a personal budget and the effects of change on the total budget help promote a more secured financial future?		he decided to adjust his budgeted amount for groceries to accommodate his new rent payment. a. Determine the percent decrease for the budgeted amount for groceries if this amount is adjusted for the increase in rent. b. Determine the new percentage each category comprises of the budget after the rent increase. c. Represent the adjusted budget in a bar graph. Standard(s): 7.1A, 7.1B, 7.1C, 7.1D, 7.1E, 7.1F, 7.1G, 7.6G, 7.13B, ELPS.c.1A, ELPS.c.1B, ELPS.c.1E, ELPS.c.2D, ELPS.c.4D, ELPS.c.4G, ELPS.c.4K, ELPS.c.5C, ELPS.c.5F, ELPS.c.5G

OVERARCHING UNDERSTANDINGS AND QUESTIONS

Instructional Focus Document
Grade 7 Mathematics

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

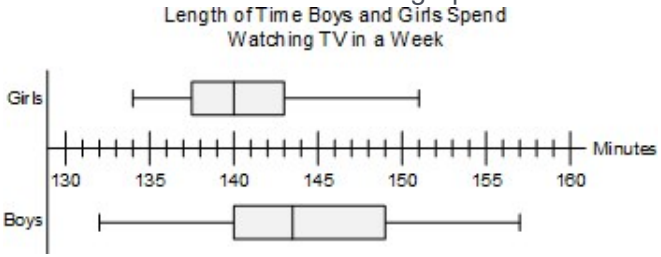
Statistical displays often reveal patterns within data that can be analyzed to interpret information, inform understanding, make predictions, influence decisions, and solve problems in everyday life with degrees of confidence.

- How does society use or make sense of the enormous amount of data in our world available at our fingertips?
- How can data and data displays be purposeful and powerful?
- Why is it important to be aware of factors that may influence conclusions, predictions, and/or decisions derived from data?

UNIT UNDERSTANDINGS AND QUESTIONS	OVERARCHING CONCEPTS AND UNIT CONCEPTS	PERFORMANCE ASSESSMENT(S)

Data can be described and quantified using various methods in order to communicate and reason statistically about the entire data set.
• What are the characteristics of a …
  ◦ box plot?
  ◦ dot plot?
• How can the …
	Measurement and Data
	• Data
	  • Numeric data
	  • Categorical data
	  • Populations
	  • Numerical summaries
	  • Conclusions and predictions
		Mathematics Grade 7 Unit 09 PA 02
		Click on the PA title to view related rubric.
		
		Analyze the problem situation(s) described below. Organize and record your work for each of the following tasks. Using precise mathematical language, justify and explain each solution process.

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

UNIT UNDERSTANDINGS AND QUESTIONS	OVERARCHING CONCEPTS AND UNIT CONCEPTS	PERFORMANCE ASSESSMENT(S)
◦ shape ◦ center ◦ spread … of a set of data be described? • How can the shapes, centers, and spreads of two sets of data be described from analyzing … ◦ comparative box plots? ◦ comparative dot plots? • What are the characteristics of a random sample? • How is data from a random sample used to make … ◦ inferences ◦ predictions ◦ comparisons … about a population? • How are quantitative and qualitative inferences, predictions, and comparisons different? • How does the size of the sample compared to the total population affect the strength of the inference about the population?	• Random samples • Variability • Graphical representations • Dot plots • Comparative dot plots • Box plots • Comparative box plots <u>Associated Mathematical Processes</u> • Application • Problem Solving Model • Tools and Techniques • Communication • Representations • Relationships • Justification	1. A random sample of the amount of time, in minutes, seventh grade students spent watching television for one week was taken for a period of three months. The data is recorded in graphs below.  a. Compare the shapes, measure of centers, and spread of the comparative box plots. b. Based on the box plot for the girls, what can be stated about the distribution of time spent watching television? Justify the inference with both qualitative and quantitative descriptions. c. If someone wanted to select either a boy or girl who watches television less than 2.5 hours a week, determine who they will most likely select based on the random samples of data displayed. Justify your inference with both qualitative and quantitative descriptions. d. The random sample included 25 students out of the 113 students who comprise the entire

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

UNIT UNDERSTANDINGS AND QUESTIONS	OVERARCHING CONCEPTS AND UNIT CONCEPTS	PERFORMANCE ASSESSMENT(S)
		7th grade class. Based on the size of the sample compared to the total number of students in 7th grade, would any inference made be considered strong or weak? Explain and justify your answer. Standard(s): 7.1A, 7.1B, 7.1C, 7.1D, 7.1E, 7.1F, 7.1G, 7.12A, 7.12B, 7.12C, ELPS.c.1A, ELPS.c.1B, ELPS.c.1E, ELPS.c.2D, ELPS.c.4G, ELPS.c.5D, ELPS.c.5F, ELPS.c.5G

MISCONCEPTIONS / UNDERDEVELOPED CONCEPTS

Misconceptions:

- Some students may think a sample from a population and a random sample from a population are the same.
- Some students may only use a sample rather than a random sample when making inferences about a population.

Underdeveloped Concepts:

- Some students may not connect the measures of center of a data distribution to the mean, median, and mode of numeric data.
- Some students may not connect the measures of shape of a data distribution to the range and interquartile range.
- Some students may not connect the differences between categorical data and numerical data.

UNIT VOCABULARY

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

- **Bar graph** – a graphical representation to organize data that uses solid bars that do not touch each other and a scaled axis to show the frequency (number of times) that each category occurs
- **Box plot (box and whisker plot)** – a graphical representation showing the five-number summary of data (minimum, lower quartile, median, upper quartile, maximum)
- **Budget** – a monthly or yearly spending and savings plan for an individual, family, business, or organization
- **Categorical data** – data that represents the attributes of a group of people, events, or objects
- **Circle graph** – a circular graph with partitions (sections) that represent a part of the total
- **Comparative box plots** – a graphical representation that consists of at least two related box plots
- **Comparative dot plots** – a graphical representation that consists of at least two related dot plots
- **Data** – information that is collected about people, events, or objects
- **Dot plot** – a graphical representation to organize small sets of data that uses dots (or Xs) to show the frequency (number of times) that each number occurs
- **Expense** – payment for goods and services
- **Fixed expenses** – expenses that are consistent from month to month
- **Graph** – a visual representation of the relationships between data collected
- **Income** – money earned or received
- **Income tax** – a percentage of money paid on the earned wages of an individual or business for the federal and/or state governments as required by law
- **Inference** – a conclusion or prediction based on data
- **Mean** – average of a set of data found by finding the sum of a set of data and dividing the sum by the number of pieces of data in the set
- **Median** – the middle number of a set of data that has been arranged in order from greatest to least or least to greatest
- **Mode of numeric data** – most frequent value in a set of data
- **Numerical data** – data that represents values or observations that can be measured and placed in ascending or descending order
- **Payroll tax** – a percentage of money that a company withholds from its employees for the federal government as required by law
- **Population** – total collection of persons, objects, or items of interest
- **Positive rational numbers** – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where *a* and *b* are counting (natural) numbers
- **Property tax** – a percentage of money collected on the value of a property for the local government as required by law
- **Qualitative** – a broad subjective description (e.g., the probability of an event occurring is certain, more likely, not likely, equally likely, or impossible.)
- **Quantitative** – a narrowed objective description associated with a quantity (e.g., the probability of selecting a consonant from the word EXPERIMENT is 1.5 times as likely as selecting a vowel from the same word, etc.)
- **Random sample** – a subset of the population selected without bias in order to make inferences about the entire population
- **Range** – the difference between the greatest number and least number in a set of data
- **Sales tax** – a percentage of money collected by a store (retailer), in addition to a good or service that was purchased, for the local government as required by law
- **Sample** – a subset of the population selected in order to make inferences about the entire population

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

- **Savings for college** – money saved for continuing education beyond high school
- **Savings for emergencies** – money saved for unexpected expenses (e.g., car repairs, emergency healthcare, etc.)
- **Savings for retirement** – money saved over the period of time an individual is employed to be spent once the individual retires from their occupation
- **Taxes** – money paid to local, state, and federal governments to pay for things the government provides to its citizens
- **Variable expenses** – expenses that vary in cost from month to month

Related Vocabulary:

- Angle
- Axis
- Central angle
- Comparative
- Distribution
- Frequency
- Horizontal
- Interquartile range
- Maximum
- Measure of center
- Minimum
- Percent
- Proportional
- Quartile
- Random
- Range
- Scale
- Shape of Data
- Skewed
- Symmetric
- Title
- Vertical

UNIT ASSESSMENT ITEMS	SYSTEM RESOURCES	OTHER RESOURCES
Unit Assessment Items that have been published by your district may be accessed through **Search All Components** in the District Resources tab. Assessment items may also be found using the Assessment Center if your district has granted access to that tool.	**Mathematics Concepts Charts** **Mathematics Grade 7 Backward Design Document** **Mathematics Grade 7 Enhanced TEKS Clarification** **Mathematics Grade 7 Focal Points with Aligned Standards and TEKS Introduction** **Mathematics Grade 7 Instructional Considerations to Activate Purposeful Planning (ICAPP)**	Texas Higher Education Coordinating Board – **Texas College and Career Readiness Standards** Texas Education Agency – **Texas Response to Curriculum Focal Points for K-8 Mathematics Revised 2013** Texas Education Agency – **Mathematics Curriculum** Texas Education Agency – **STAAR Mathematics Resources**

TITLE : Unit 09: Data Representations

SUGGESTED DURATION : 15 days

	Mathematics Grade 7 STAAR Analysis Resources **Mathematics Grade 7 STAAR Blueprint and Item Percentages** **Mathematics Grade 7 STAAR Enhanced Blueprint** **Mathematics Grade 7 Vertical Alignment** **Mathematics Grade 7_Unit 09_TEKS Resource System STAAR Analysis** **Mathematics K-HS Overarching Understandings and Questions** **Mathematics Long Term Transfer Goals** **Mathematics Suggested Basic Manipulatives by Grade Level** **Mathematics Suggested Engaging Literature** **Mathematics Teacher Manipulative Google Slide Decks** **Mathematics Texas Education Agency Grade 7 TEKS Supporting Information (with TEKS Resource System Comments)** **Mathematics Vertical Quick Guide**	Texas Education Agency Texas Gateway – **Revised Mathematics TEKS: Vertical Alignment Charts** Texas Education Agency Texas Gateway – **Mathematics TEKS: Supporting Information** Texas Education Agency Texas Gateway – **Interactive Mathematics Glossary** Texas Education Agency Texas Gateway – **Resources Aligned to Grade 7 Mathematics TEKS** Texas Instruments – **Graphing Calculator Tutorials**

Instructional Focus Document
Grade 7 Mathematics

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TAUGHT DIRECTLY TEKS

TEKS INTENDED TO BE EXPLICITLY TAUGHT IN THIS UNIT.

TEKS/SE Legend:

- ***Knowledge and Skills Statements (TEKS) identified by TEA are in italicized, bolded, black text.***
- **Student Expectations (TEKS) identified by TEA are in bolded, black text.**
- ***Student Expectations (TEKS) are labeled Readiness as identified by TEA of the assessed curriculum.***
- ***Student Expectations (TEKS) are labeled Supporting as identified by TEA of the assessed curriculum.***
- ***Student Expectations (TEKS) are labeled Process standards as identified by TEA of the assessed curriculum.***
- Portions of the Student Expectations (TEKS) that are not included in this unit but are taught in previous or future units are indicated by a ~~strike-through~~.

Specificity Legend:

- Supporting information / clarifications (specificity) written by TEKS Resource System are in blue text.
- *Unit-specific clarifications are in italicized, blue text.*
- Information from Texas Education Agency (TEA), Texas College and Career Readiness Standards (TxCCRS), Texas Response to Curriculum Focal Points (TxRCFP) is labeled.
- A Partial Specificity label indicates that a portion of the specificity not aligned to this unit has been removed.

TEKS# / SE#	TEKS	SPECIFICITY
7.1	***Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:***	
7.1A	**Apply mathematics to problems arising in everyday life, society, and the workplace.**	Apply

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY

	Process Standard	MATHEMATICS TO PROBLEMS ARISING IN EVERYDAY LIFE, SOCIETY, AND THE WORKPLACE
		
		Including, but not limited to:
		
		• Mathematical problem situations within and between disciplines
		  ◦ Everyday life
		  ◦ Society
		  ◦ Workplace
		
		Note(s):
		
		• The mathematical process standards may be applied to all content standards as appropriate.
		• TxRCFP:
		  ◦ Developing fluency with rational numbers and operations to solve problems in a variety of contexts
		  ◦ Representing and applying proportional relationships
		  ◦ Using expressions and equations to describe relationships in a variety of contexts, including geometric problems
		  ◦ Comparing sets of data
		• TxCCRS:
		  ◦ VII.D. Problem Solving and Reasoning – Real-world problem solving
		  • VII.D.1. Interpret results of the mathematical problem in terms of the original real-world situation.
		  ◦ IX.A. Connections – Connections among the strands of mathematics
		  • IX.A.1. Connect and use multiple key concepts of mathematics in situations and problems.
		  • IX.A.2. Connect mathematics to the study of other disciplines.
		  ◦ IX.B. Connections – Connections of mathematics to nature, real-world situations, and everyday life
		  • IX.B.1. Use multiple representations to demonstrate links between mathematical

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		and real-world situations. • IX.B.2. Understand and use appropriate mathematical models in the natural, physical, and social sciences. • IX.B.3. Know and understand the use of mathematics in a variety of careers and professions.

7.1B	**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.** ***Process Standard***	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
		
		Including, but not limited to:
		
		• Problem-solving model
		  ◦ Analyze given information
		  ◦ Formulate a plan or strategy
		  ◦ Determine a solution
		  ◦ Justify the solution
		  ◦ Evaluate the problem-solving process and the reasonableness of the solution
		
		Note(s):
		
		• The mathematical process standards may be applied to all content standards as appropriate.
		• TxRCFP:
		  ◦ Developing fluency with rational numbers and operations to solve problems in a variety of contexts
		  ◦ Representing and applying proportional relationships

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Using expressions and equations to describe relationships in a variety of contexts, including geometric problems ◦ Comparing sets of data • TxCCRS: ◦ I.B. Numeric Reasoning – Number sense and number concepts • I.B.1. Use estimation to check for errors and reasonableness of solutions. ◦ V.A. Statistical Reasoning – Design a study • V.A.1. Formulate a statistical question, plan an investigation, and collect data. ◦ VII.A. Problem Solving and Reasoning – Mathematical problem solving • VII.A.1. Analyze given information. • VII.A.2. Formulate a plan or strategy. • VII.A.3. Determine a solution. • VII.A.4. Justify the solution. • VII.A.5. Evaluate the problem-solving process. ◦ VII.D. Problem Solving and Reasoning – Real-world problem solving • VII.D.2. Evaluate the problem-solving process.
7.1C	**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.** ***Process Standard***	Partial Specificity Select TOOLS, INCLUDING PAPER AND PENCIL AND TECHNOLOGY AS APPROPRIATE, AND TECHNIQUES, INCLUDING MENTAL MATH, ESTIMATION, AND NUMBER SENSE AS APPROPRIATE, TO SOLVE PROBLEMS Including, but not limited to: • Appropriate selection of tool(s) and techniques to apply in order to solve problems ◦ Tools • Paper and pencil • Technology

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Techniques • Mental math • Estimation • Number sense Note(s): • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: ◦ Developing fluency with rational numbers and operations to solve problems in a variety of contexts ◦ Representing and applying proportional relationships ◦ Using expressions and equations to describe relationships in a variety of contexts, including geometric problems ◦ Comparing sets of data • TxCCRS: ◦ I.B. Numeric Reasoning – Number sense and number concepts • I.B.1. Use estimation to check for errors and reasonableness of solutions. ◦ V.C. Statistical Reasoning – Analyze, interpret, and draw conclusions from data • V.C.2. Analyze relationships between paired data using spreadsheets, graphing calculators, or statistical software.
7.1D	**Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.** ***Process Standard***	Communicate MATHEMATICAL IDEAS, REASONING, AND THEIR IMPLICATIONS USING MULTIPLE REPRESENTATIONS, INCLUDING SYMBOLS, DIAGRAMS, GRAPHS, AND LANGUAGE AS APPROPRIATE Including, but not limited to:

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY

		• Mathematical ideas, reasoning, and their implications
		  ◦ Multiple representations, as appropriate
		  • Symbols
		  • Diagrams
		  • Graphs
		  • Language
		
		Note(s):
		
		• The mathematical process standards may be applied to all content standards as appropriate.
		• TxRCFP:
		  ◦ Developing fluency with rational numbers and operations to solve problems in a variety of contexts
		  ◦ Representing and applying proportional relationships
		  ◦ Using expressions and equations to describe relationships in a variety of contexts, including geometric problems
		  ◦ Comparing sets of data
		• TxCCRS:
		  ◦ II.D. Algebraic Reasoning – Representing relationships
		  • II.D.1. Interpret multiple representations of equations, inequalities, and relationships.
		  • II.D.2. Convert among multiple representations of equations, inequalities, and relationships.
		  ◦ VIII.A. Communication and Representation – Language, terms, and symbols of mathematics
		  • VIII.A.1. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem.
		  • VIII.A.2. Use mathematical language to represent and communicate the mathematical concepts in a problem.

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		• VIII.A.3. Use mathematical language for reasoning, problem solving, making connections, and generalizing. ◦ VIII.B. Communication and Representation – Interpretation of mathematical work • VIII.B.1. Model and interpret mathematical ideas and concepts using multiple representations. • VIII.B.2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context. ◦ VIII.C. Communication and Representation – Presentation and representation of mathematical work • VIII.C.1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, models, graphs, and words. • VIII.C.2. Create and use representations to organize, record, and communicate mathematical ideas. • VIII.C.3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications. ◦ IX.B. Connections – Connections of mathematics to nature, real-world situations, and everyday life • IX.B.1. Use multiple representations to demonstrate links between mathematical and real-world situations.
7.1E	**Create and use representations to organize, record, and communicate mathematical ideas.** ***Process Standard***	Create, Use REPRESENTATIONS TO ORGANIZE, RECORD, AND COMMUNICATE MATHEMATICAL IDEAS Including, but not limited to: • Representations of mathematical ideas ◦ Organize ◦ Record

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Communicate • Evaluation of the effectiveness of representations to ensure clarity of mathematical ideas being communicated • Appropriate mathematical vocabulary and phrasing when communicating mathematical ideas Note(s): • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: ◦ Developing fluency with rational numbers and operations to solve problems in a variety of contexts ◦ Representing and applying proportional relationships ◦ Using expressions and equations to describe relationships in a variety of contexts, including geometric problems ◦ Comparing sets of data • TxCCRS: ◦ VIII.B. Communication and Representation – Interpretation of mathematical work • VIII.B.1. Model and interpret mathematical ideas and concepts using multiple representations. • VIII.B.2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context. ◦ VIII.C. Communication and Representation – Presentation and representation of mathematical work • VIII.C.1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, models, graphs, and words. • VIII.C.2. Create and use representations to organize, record, and communicate mathematical ideas.
7.1F	**Analyze mathematical relationships to connect and communicate mathematical ideas.**	Analyze

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY

	Process Standard	MATHEMATICAL RELATIONSHIPS TO CONNECT AND COMMUNICATE MATHEMATICAL IDEAS
		
		Including, but not limited to:
		
		• Mathematical relationships
		  ◦ Connect and communicate mathematical ideas
		  • Conjectures and generalizations from sets of examples and non-examples, patterns, etc.
		  • Current knowledge to new learning
		
		Note(s):
		
		• The mathematical process standards may be applied to all content standards as appropriate.
		• TxRCFP:
		  ◦ Developing fluency with rational numbers and operations to solve problems in a variety of contexts
		  ◦ Representing and applying proportional relationships
		  ◦ Using expressions and equations to describe relationships in a variety of contexts, including geometric problems
		  ◦ Comparing sets of data
		• TxCCRS:
		  ◦ VII.A. Problem Solving and Reasoning – Mathematical problem solving
		  • VII.A.1. Analyze given information.
		  ◦ VIII.A. Communication and Representation – Language, terms, and symbols of mathematics
		  • VIII.A.1. Use mathematical symbols, terminology, and notation to represent given and unknown information in a problem.
		  • VIII.A.2. Use mathematical language to represent and communicate the mathematical concepts in a problem.
		  • VIII.A.3. Use mathematical language for reasoning, problem solving, making

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		connections, and generalizing. ◦ VIII.B. Communication and Representation – Interpretation of mathematical work • VIII.B.1. Model and interpret mathematical ideas and concepts using multiple representations. ◦ VIII.C. Communication and Representation – Presentation and representation of mathematical work • VIII.C.1. Communicate mathematical ideas, reasoning, and their implications using symbols, diagrams, models, graphs, and words. • VIII.C.2. Create and use representations to organize, record, and communicate mathematical ideas. • VIII.C.3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications. ◦ IX.A. Connections – Connections among the strands of mathematics • IX.A.1. Connect and use multiple key concepts of mathematics in situations and problems. • IX.A.2. Connect mathematics to the study of other disciplines.
7.1G	**Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.** ***Process Standard***	Display, Explain, Justify MATHEMATICAL IDEAS AND ARGUMENTS USING PRECISE MATHEMATICAL LANGUAGE IN WRITTEN OR ORAL COMMUNICATION Including, but not limited to: • Mathematical ideas and arguments ◦ Validation of conclusions • Displays to make work visible to others ◦ Diagrams, visual aids, written work, etc. • Explanations and justifications

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Precise mathematical language in written or oral communication Note(s): • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: ◦ Developing fluency with rational numbers and operations to solve problems in a variety of contexts ◦ Representing and applying proportional relationships ◦ Using expressions and equations to describe relationships in a variety of contexts, including geometric problems ◦ Comparing sets of data • TxCCRS: ◦ VII.A. Problem Solving and Reasoning – Mathematical problem solving • VII.A.4. Justify the solution. ◦ VII.B. Problem Solving and Reasoning – Proportional reasoning • VII.B.1. Use proportional reasoning to solve problems that require fractions, ratios, percentages, decimals, and proportions in a variety of contexts using multiple representations. ◦ VII.C. Problem Solving and Reasoning – Logical reasoning • VII.C.1. Develop and evaluate convincing arguments. ◦ VIII.A. Communication and Representation – Language, terms, and symbols of mathematics • VIII. A.3. Use mathematical language for reasoning, problem solving, making connections, and generalizing. ◦ VIII.B. Communication and Representation – Interpretation of mathematical work • VIII.B.1. Model and interpret mathematical ideas and concepts using multiple representations. • VIII.B.2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context.

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ VIII.C. Communication and Representation – Presentation and representation of mathematical work • VIII. C.3. Explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.
7.6	***Proportionality. The student applies mathematical process standards to use probability and statistics to describe or solve problems involving proportional relationships. The student is expected to:***	
7.6G	**Solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents.** ***Readiness Standard***	Solve PROBLEMS USING DATA REPRESENTED IN BAR GRAPHS, DOT PLOTS, AND CIRCLE GRAPHS, INCLUDING PART-TO-WHOLE AND PART-TO-PART COMPARISONS AND EQUIVALENTS Including, but not limited to: • Graph – a visual representation of the relationships between data collected ◦ Organization of data used to interpret data, draw conclusions, and make comparisons • Data – information that is collected about people, events, or objects ◦ Categorical data – data that represents the attributes of a group of people, events, or objects • May represent number or ranges of numbers ◦ Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order • Can be counted (discrete) or measured (continuous) • Limitations ◦ Various forms of positive rational numbers

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		• Counting (natural) numbers • Decimals • Fractions • Percents converted to equivalent decimals or fractions for multiplying or dividing • Data representations ◦ Bar graph – a graphical representation to organize data that uses solid bars that do not touch each other and scaled axis to show the frequency (number of times) that each category occurs • Characteristics of a bar graph ◦ Titles, subtitles, and labels • Title represents the purpose of collected data • Subtitles clarify the meaning of the data represented on each axis • Labels identify each category ◦ Representation of categorical data • Bars ◦ Placed in a horizontal or vertical linear arrangement to represent data ◦ Solid bars that are equal in width ◦ Independent bars that do not touch ◦ Length of the bar represents the distance from zero on the axis scale • Axis ◦ Represented as a number line ◦ Scale intervals proportionally displayed ◦ Intervals of one or more units • Every piece of data represented using a one-to-one or scaled correspondence as indicated by the intervals on the axis • Value of the data represented by the bar ◦ Determined by reading the number on the scaled axis

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		associated with the length of the bar ◦ Represents the frequency for that category ◦ Dot plot – a graphical representation to organize small sets of data that uses dots (or Xs) and an axis to show the frequency (number of times) that each number occurs • Characteristics of a dot plot ◦ Titles, subtitles, and labels • Title represents the purpose of collected data • Subtitle clarifies the meaning of number line • Labels identify each numerical increment below the line ◦ Representation of numerical data • Dots (or Xs) ◦ Placed in a horizontal or vertical linear arrangement ◦ Vertical graph beginning at the bottom and progressing up above the line ◦ Horizontal graph beginning at the left and progressing to the right of the line ◦ Spaced approximately equal distances apart within each category • Axis ◦ Numerical data represented by a number line labeled with proportional increments • Every piece of data represented using a one-to-one or scaled correspondence, as indicated by the key ◦ Dots (or Xs) generally represent one count ◦ May represent multiple counts if indicated with a key • Value of the data in each category ◦ Determined by the number of dots (or Xs) or total value of dots (or Xs), as indicated by the key if given ◦ Represents the frequency for that category

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		• Density of dots relates to the frequency distribution of the data • Shape of the dot plot may be used to compare shape, spread, and center of data ◦ Circle graph – a circular graph with partitions (sections) that represent a part of the total • Characteristics of a circle graph ◦ Titles and labels • Title represents the purpose of collected data • Labels identify each category ◦ Representation of categorical data • Partitioned circle ◦ Size of each partition is proportional to the magnitude of the quantity and its relationship to the 360° of the circle ◦ $\frac{\text{percent}}{100} = \frac{\text{angle measure}}{360}$ ◦ Partitions generally labeled as percents or fractions.. • Labeled as percents, sum of the quantities of the partitions is 100% • Labeled as fractions, sum of the quantities of the partitions is 1 • Proportional relationships within data representations ◦ Part-to-whole comparisons and equivalents ◦ Part-to-part comparisons and equivalents Note(s): • Grade Level(s): ◦ In previous grades, students have represented data with pictographs, bar graphs, frequency tables, dot plots, stem-and-leaf plots scatterplots, histograms, box plots, relative frequency tables, and percent bar graphs. ◦ Grade 7 introduces solving problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents. ◦ Various mathematical process standards will be applied to this student expectation as

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY

		appropriate.
		• TxRCFP:
		  ◦ Representing and applying proportional relationships
		• TxCCRS:
		  ◦ I.A. Numeric Reasoning – Number representations and operations
		  • I.A.2. Perform computations with rational and irrational numbers.
		  ◦ V.B. Statistical Reasoning – Describe data
		  • V.B.3. Compute and describe the study data with measures of center and basic notions of spread.
		  ◦ VII.A. Problem Solving and Reasoning – Mathematical problem solving
		  • VII.A.3. Determine a solution.
		  ◦ VII.B. Problem Solving and Reasoning – Proportional reasoning
		  • VII.B.1. Use proportional reasoning to solve problems that require fractions, ratios, percentages, decimals, and proportions in a variety of contexts using multiple representations.

7.12	***Measurement and data. The student applies mathematical process standards to use statistical representations to analyze data. The student is expected to:***	
7.12A	**Compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads.** ***Readiness Standard***	Compare TWO GROUPS OF NUMERIC DATA USING COMPARATIVE DOT PLOTS OR BOX PLOTS BY COMPARING THEIR SHAPES, CENTERS, AND SPREADS Including, but not limited to: • Graph – a visual representation of the relationships between data collected

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Organization of data used to describe and summarize data • Data – information that is collected about people, events, or objects ◦ Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order • Can be counted (discrete) or measured (continuous) • Limitations ◦ Various forms of positive rational numbers • Counting (natural) numbers • Decimals • Fractions • Percents • Data representations ◦ Dot plot – a graphical representation to organize small sets of data that uses dots (or Xs) and an axis to show the frequency (number of times) that each number occurs ◦ Comparative dot plots – a graphical representation that consists of at least two related dot plots • Characteristics of a comparative dot plot ◦ Display of two dot plots of the same variable from two different data sets • Back-to-back graphs with the scale in the middle • Dots (or Xs) for one data set recorded above or to the right of the scale and dots (or Xs) for the other data set recorded below or to the left of the scale ◦ Every piece of data represented using a one-to-one or scaled correspondence, as indicated by the key • Dots (or Xs) generally represent one count ◦ May represent multiple counts if indicated with a key • Value of the data in each category ◦ Determined by the number of dots (or Xs) or total value of dots (or Xs), as indicated by the key if given

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Represents the frequency for that category ◦ Density of the dots relates to the frequency distribution of the data ◦ Shape of the dot plot may be used to compare the shape, spread, and center of data, including mode, range, and outliers between and among multiple data sets ◦ Box plot (box and whisker plot) – a graphical representation showing the five-number summary of data (minimum, lower quartile, median, upper quartile, maximum) ◦ Comparative box plots – a graphical representation that consists of at least two related box plots • Characteristics of a comparative box plot ◦ Display of two box plots of the same variable from two different data sets • Two box plots, each representing a different data set, stacked one above the other with the scale below both box plots; or two box plots, each representing a different data set, with the scale in between the two box plots ◦ Density of quartiles represents the frequency distribution of the data ◦ Shape of the box plot may be used to compare the spread of the data, including median (center), upper and lower extremes, quartiles, interquartile range (IQR), and range between and among multiple data sets • Measures of center of a data distribution ◦ Mean – average of a set of data found by finding the sum of a set of data and dividing the sum by the number of pieces of data in the set ◦ Median – the middle number of a set of data that has been arranged in order from greatest to least or least to greatest ◦ Mode of numeric data – most frequent value in a set of data • Measures of shape of a data distribution ◦ Range – the difference between the greatest number and least number in a set of data ◦ Interquartile range • Shape of the data distribution

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Skewed right • Mean usually greater than the median, and median greater than the mode • Shape of the data has a tail to the right when graphed ◦ Symmetric • Mean, median, and mode usually approximately the same • Shape of the data resembles a bell curve when graphed ◦ Skewed left • Mean usually less than the median, and median less than the mode • Shape of the data has a tail to the left when graphed • Comparisons of shapes, centers, and spreads ◦ Comparative dot plots ◦ Comparative box plots Note(s): • Grade Level(s): ◦ Grade 6 represented numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots. ◦ Grade 6 used the graphical representation of numeric data to describe the center, spread, and shape of the data distribution. ◦ Grade 6 summarized numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and used these summaries to describe the center, spread, and shape of the data distribution. ◦ Grade 8 will 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. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP:

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Comparing sets of data • TxCCRS: ◦ V.B. Statistical Reasoning – Describe data • V.B.3. Compute and describe the study data with measures of center and basic notions of spread. ◦ V.C. Statistical Reasoning – Analyze, interpret, and draw conclusions from data • V.C.1. Analyze data sets using graphs and summary statistics.
7.12B	**Use data from a random sample to make inferences about a population.** ***Supporting Standard***	Use DATA FROM A RANDOM SAMPLE TO MAKE INFERENCES ABOUT A POPULATION Including, but not limited to: • Data – information that is collected about people, events, or objects • Limitations ◦ Various forms of positive rational numbers • Counting (natural) numbers • Decimals • Fractions • Percents • Inference – a conclusion or prediction based on data ◦ Size of hte sample influences the strength of the inference regarding the population • Population – total collection of persons, objects, or items of interest • Sample – a subset of the population selected in order to make inferences about the entire population • Random sample – a subset of the population selected without bias in order to make inferences about the entire population ◦ Random samples are more likely to contain data that can be used to make predictions

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		about a whole population. • Data from a random sample given or collected in various forms ◦ Verbal ◦ Tabular (vertical/horizontal) ◦ Graphical • Inferences based on random sample ◦ Qualitative – a broad subjective description (e.g., the probability of an event occurring is certain, more likely, not likely, equally likely, or impossible.) ◦ Quantitative – a narrowed objective description associated with a quantity (e.g., the probability of selecting a consonant from the word EXPERIMENT is 1.5 times as likely as selecting a vowel from the same word, etc.) • Statistical analysis of data in a random sample to make inferences about a population Note(s): • Grade Level(s): ◦ Grade 7 introduces using data from random samples to make inferences about a population. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: ◦ Comparing sets of data • TxCCRS: ◦ V.C. Statistical Reasoning – Analyze, interpret, and draw conclusions from data • V.C.1. Analyze data sets using graphs and summary statistics. • V.C.3. Make predictions using summary statistics. ◦ VIII.B. Communication and Representation – Interpretation of mathematical work • VIII.B.2. Summarize and interpret mathematical information provided orally, visually, or in written form within the given context. ◦ IX.B. Connections – Connections of mathematics to nature, real-world situations, and

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		everyday life • IX.B.1. Use multiple representations to demonstrate links between mathematical and real-world situations.

7.12C	**Compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations.**
	Supporting Standard
		Compare
		
		TWO POPULATIONS BASED ON DATA IN RANDOM SAMPLES FROM THESE POPULATIONS, INCLUDING INFORMAL COMPARATIVE INFERENCES ABOUT DIFFERENCES BETWEEN THE TWO POPULATIONS
		
		Including, but not limited to:
		
		• Data – information that is collected about people, events, or objects
		• Limitations
		  ◦ Various forms of positive rational numbers
		  • Counting (natural) numbers
		  • Decimals
		  • Fractions
		  • Percents
		• Inference – a conclusion or prediction based on data
		  ◦ Size of the sample influences the strength of the inference regarding the population
		• Population – total collection of persons, objects, or items of interest
		• Sample – a subset of the population selected in order to make inferences about the entire population
		• Random sample – a subset of the population selected without bias in order to make inferences about the entire population
		  ◦ Random samples are more likely to contain data that can be used to make predictions about a whole population.
		• Data from a random sample given or collected in various forms

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Verbal ◦ Tabular (vertical/horizontal) ◦ Graphical • Informal comparative inferences based on random samples from two populations ◦ Qualitative – a broad subjective description (e.g., the probability of an event occurring is certain, more likely, not likely, equally likely, or impossible.) ◦ Quantitative – a narrowed objective description associated with a quantity (e.g., the probability of selecting a consonant from the word EXPERIMENT is 1.5 times as likely as selecting a vowel from the same word, etc.) • Statistical analysis of data from random sample to make inferences about two populations ◦ Comparison of two populations ◦ Comparison of the shape, center, and spread of data from random samples using comparative dot plots and comparative box plots Note(s): • Grade Level(s): ◦ Grade 7 introduces comparing two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations. ◦ Grade 8 will 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. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: ◦ Comparing sets of data • TxCCRS: ◦ V.C. Statistical Reasoning – Analyze, interpret, and draw conclusions from data • V.C.1. Analyze data sets using graphs and summary statistics.

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		• V.C.3. Make predictions using summary statistics. ◦ VII.B. Problem Solving and Reasoning – Proportional reasoning • VII.B.1. Use proportional reasoning to solve problems that require fractions, ratios, percentages, decimals, and proportions in a variety of contexts using multiple representations. ◦ IX.B. Connections – Connections of mathematics to nature, real-world situations, and everyday life • IX.B.1. Use multiple representations to demonstrate links between mathematical and real-world situations.
7.13	***Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:***	
7.13B	**Identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget.** ***Supporting Standard***	Identify THE COMPONENTS OF A PERSONAL BUDGET, INCLUDING INCOME; PLANNED SAVINGS FOR COLLEGE, RETIREMENT, AND EMERGENCIES; TAXES; AND FIXED AND VARIABLE EXPENSES Including, but not limited to: • Budget – a monthly or yearly spending and savings plan for an individual, family, business, or organization • Budgets based on financial records help people plan and make choices about how to spend and save their money • Components of a personal budget ◦ Income – money earned or received

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY
		◦ Savings for college – money saved for continuing education beyond high school ◦ Savings for retirement – money saved over the period of time an individual is employed to be spent once the individual retires from their occupation ◦ Savings for emergencies – money saved for unexpected expenses (e.g., car repairs, emergency healthcare, etc.) ◦ Taxes – money paid to local, state, and federal governments to pay for things the government provides to its citizens • Various types of taxes ◦ Income tax – a percentage of money paid on the earned wages of an individual or business for the federal and/or state governments as required by law ◦ Payroll tax – a percentage of money that a company withholds from its employees for the federal government as required by law ◦ Sales tax – a percentage of money collected by a store (retailer), in addition to a good or service that was purchased, for the local government as required by law ◦ Property tax – a percentage of money collected on the value of a property for the local government as required by law ◦ Expense – payment for goods and services • Fixed expenses – expenses that are consistent from month to month • Variable expenses – expenses that vary in cost from month to month Calculate WHAT PERCENTAGE EACH CATEGORY OF A PERSONAL BUDGET COMPRISES OF THE TOTAL BUDGET Including, but not limited to:

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

TEKS# / SE#	TEKS	SPECIFICITY

		• Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where *a* and *b* are counting (natural) numbers
		• Various forms of positive rational numbers
		  ◦ Counting (natural) numbers
		  ◦ Decimals
		  ◦ Percents
		• Proportional reasoning to determine percentages within a budget
		• Proportional reasoning to determine amounts within a budget
		
		Note(s):
		
		• Grade Level(s):
		  ◦ Grade 5 balanced a simple budget.
		  ◦ Various mathematical process standards will be applied to this student expectation as appropriate.
		• TxRCFP:
		  ◦ Financial Literacy
		• TxCCRS:
		  ◦ I.A. Numeric Reasoning – Number representations and operations
		  • I.A.2. Perform computations with rational and irrational numbers.

Instructional Focus Document
Grade 7 Mathematics

TITLE : Unit 09: Data Representations **SUGGESTED DURATION :** 15 days

ELPS#	SUBSECTION C: CROSS-CURRICULAR SECOND LANGUAGE ACQUISITION ESSENTIAL KNOWLEDGE AND SKILLS.

The English Language Proficiency Standards (ELPS), as required by 19 Texas Administrative Code, Chapter 74, Subchapter A, §74.4, outline English language proficiency level descriptors and student expectations for English language learners (ELLs). School districts are required to implement ELPS as an integral part of each subject in the required curriculum.

School districts shall provide instruction in the knowledge and skills of the foundation and enrichment curriculum in a manner that is linguistically accommodated commensurate with the student's levels of English language proficiency to ensure that the student learns the knowledge and skills in the required curriculum.

School districts shall provide content-based instruction including the cross-curricular second language acquisition essential knowledge and skills in subsection (c) of the ELPS in a manner that is linguistically accommodated to help the student acquire English language proficiency.
http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4

Choose appropriate ELPS to support instruction.

Last Updated 08/01/2018