Quarter 1		Quarter 2		Quarter 3		Quarter 4	
The Nature of Probability and Statistics, Frequency Distributions and Graphs, Data Description		Probability and Counting Rules, Discrete Probability Distributions, The Normal Distribution		Normal Distributions, Confidence Intervals and Sample Size, Hypothesis Testing		Testing the Difference Between Two Means, Two Proportions, and Two Variances, Other Chi-Square Tests, Correlation and Regression	
August 6 2018 – October 5, 2018		October 15, 2018 – December 19, 2018		January 7, 2019 – March 8, 2019		March 18, 2019 – May 23, 2019	
S.ID.A.1	S.IC.A.3	S.CP.A.1	S.MD.B.10	S.MD.A.6		S.ID.B.10	
S.ID.A.2	S.IC.A.4	S.CP.A.2		S.MD.A.8		S.ID.B.11	
S.ID.A.3	S.IC.A.5	S.CP.A.3		S.MD.B.10		S.ID.B.12	
S.ID.A.4	S.IC.B.8	S.CP.B.4		S.IC.A.6		S.ID.B.13	
S.ID.A.5	S.IC.B.9	S.CP.B.5		S.IC.A.7		S.MD.A.8	
S.ID.A.6	S.IC.B.10	S.MD.A.1		S.IC.C.14		S.IC.B.12	
S.ID.A.7	S.IC.B.11	S.MD.A.2		S.IC.D.15			
S.ID.A.8	S.IC.C.13	S.MD.A.3		S.IC.D.16			
S.ID.A.9		S.MD.A.4		S.IC.D.17			
S.MD.B.9		S.MD.A.5		S.IC.E.18			
S.MD.B.10		S.MD.A.6		S.IC.E.19			
S.IC.A.1		S.MD.A.7a & b		S.IC.E.20			
S.IC.A.2		S.MD.A.8					

Introduction

Destination 2025, Shelby County Schools' 10-year strategic plan, is designed not only to improve the quality of public education, but also to create a more knowledgeable, productive workforce and ultimately benefit our entire community.

What will success look like?

In order to achieve these ambitious goals, we must collectively work to provide our students with high quality, college and career ready aligned instruction. The Tennessee State Standards provide a common set of expectations for what students will know and be able to do at the end of a grade. The State of Tennessee provides two sets of standards, which include the Standards for Mathematical Content and The Standards for Mathematical Practice. The Content Standards set high expectations for all students to ensure that Tennessee graduates are prepared to meet the rigorous demands of mathematical understanding for college and career. The eight Standards for Mathematical Practice describe the varieties of expertise, habits of mind, and productive dispositions that educators seek to develop in all students. The Tennessee State Standards also represent three fundamental shifts in mathematics instruction: **focus, coherence and rigor**.

The **Standards for Mathematical Practice** describe varieties of expertise, habits of minds and productive dispositions that mathematics educators at all levels should seek to develop in their students. These practices rest on important National Council of Teachers of Mathematics (NCTM) "processes and proficiencies" with longstanding importance in mathematics education. Throughout the year, students should continue to develop proficiency with the eight Standards for Mathematical Practice. The following are the eight Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of them.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

This curriculum map is designed to help teachers make effective decisions about what mathematical content to teach so that ultimately our students can reach Destination 2025. Throughout this curriculum map, you will see resources as well as links to tasks that will support you in ensuring that students are able to reach the demands of the standards in your classroom. In addition to the resources embedded in the map, there are some high-leverage resources around the content standards and mathematical practice standards that teachers should consistently access. For a full description of each, click on the links below.

Tennessee Mathematics Content Standards

Standards for Mathematical Practice

Literacy Skills for Mathematical Proficency

Structure of the Standards

Structure of the TN State Standards include:

- **Content Standards** - Statements of what a student should know, understand, and be able to do.

- **Clusters** - Groups of related standards. Cluster headings may be considered as the big idea(s) that the group of standards they represent are addressing. They are therefore useful as a quick summary of the progression of ideas that the standards in a domain are covering and can help teachers to determine the focus of the standards they are teaching.

- **Domains** - A large category of mathematics that the clusters and their respective content standards delineate and address. For example, Number and Operations – Fractions is a domain under which there are a number of clusters (the big ideas that will be addressed) along with their respective content standards, which give the specifics of what the student should know, understand, and be able to do when working with fractions.

- **Conceptual Categories** – The content standards, clusters, and domains in the 9th-12th grades are further organized under conceptual categories. These are very broad categories of mathematical thought and lend themselves to the organization of high school course work. For example, Algebra is a conceptual category in the high school standards under which are domains such as Seeing Structure in Expressions, Creating Equations, Arithmetic with Polynomials and Rational Expressions, etc.

How to Use the Maps

Overview
An overview is provided for each quarter and includes the topics, focus standards, intended rigor of the standards and foundational skills needed for success of those standards.

Your curriculum map contains four columns that each highlight specific instructional components. Use the details below as a guide for information included in each column.

Tennessee State Standards
TN State Standards are located in the left column. Each content standard is identified as Major Content or Supporting Content (for Algebra I, Algebra II & Geometry only). A key can be found at the bottom of the map.

Content
This section contains learning objectives based upon the TN State Standards. Best practices tell us that clearly communicating measurable objectives lead to greater student understanding. Additionally, essential questions are provided to guide student exploration and inquiry.

Instructional Support & Resources
District and web-based resources have been provided in the Instructional Support & Resources columns. You will find a variety of instructional resources that align with the content standards. The additional resources provided should be used as needed for content support and scaffolding. The inclusion of vocabulary serves as a resource for teacher planning and for building a common language across K-12 mathematics. One of the goals for Tennessee State Standards is to create a common language, and the expectation is that teachers will embed this language throughout their daily lessons.

Topics Addressed in Quarter

- **Testing the Difference Between Two Means, Two Proportions, and Two Variances**
- **Other Chi-Square Tests**
- **Correlation and Regression**

Overview

The basic concepts of hypothesis testing were explained in Chapter 8. With the *z*, *t*, and X^2 tests, a sample mean, variance, or proportion can be compared to a specific population mean, variance, or proportion to determine whether the null hypothesis should be rejected. In this quarter, students study the many instances when researchers wish to compare two sample means, using experimental and control groups. For example, the average lifetimes of two different brands of bus tires might be compared to see whether there is any difference in tread wear. Two different brands of fertilizer might be tested to see whether one is better than the other for growing plants. In the comparison of two means, the same basic steps for hypothesis testing shown in Chapter 8 are used, and the *z* and *t* tests are also used. When comparing two means by using the *t* test, the researcher must decide if the two samples are *independent* or *dependent.* The concepts of independent and dependent samples will be explained in this quarter as well as the *z* test that can be used to compare two proportion.

Students study the chi-square distribution that was used in Chapters 7 and 8 to find a confidence interval for a variance or standard deviation and to test a hypothesis about a single variance or standard deviation. It can also be used for tests concerning *frequency distributions.* The chi-square distribution can be used to test the *independence* of two variables. Finally, the chi-square distribution can be used to test the *homogeneity of proportions.* Students explore the chi-square distribution and its applications. Finally, in this quarter, students study *correlation* and *regression*, used to describe the nature of the relationship between variables, that is, positive or negative, linear or nonlinear.

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Chapter 9: Testing the Difference Between Two Means, Two Proportions, and Two Variances **Chapter 11**: Other Chi-Square Tests **(Allow approximately 5-6 weeks for instruction, review, and assessment)**			
Domain: Making Inferences and Justifying Conclusions **Cluster:** Design and conduct a statistical experiment to study a problem, then interpret and communicate the outcomes. **S.IC.B.12** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **Domain:** Using Probability to Make Decisions **Cluster:** Understand and use discrete probability distributions. **S.MD.A.8** Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	**Essential Question(s):** • How can a confidence interval be interpreted in context of the problem? • How is the width of the interval affected by changes in sample size or confidence level? • How can a sample size be determined for a study that would place your results within a specified error? • Can confidence intervals be used to draw conclusions about a claim? • Which hypothesis test is appropriate for a particular data set? • What makes results "statistically significant" and how are they determined so? • When is it appropriate to use a matched pair t-test instead of a two sample t-test? • How can hypothesis testing be used to find out if a difference between two samples is greater than a given value? **Objective(s)** The student will: • Test the difference between two-sample means, using the z Test.	**Elementary Statistics Textbook (Bluman)** 9-1 Testing the Difference Between Two Means: Using the z Test **Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Videos: Significance Tests and Confidence Intervals (Two Samples) Video: Z-Tests for Two Sample Means Stat Trek: Introduction to Hypothesis Testing	**Sections 9-1 through 9-4** **Vocabulary** Dependent samples, independent samples, pooled estimate of the variance ***Elementary Statistics Textbook (Bluman)*** *Statistics Today*, pp. 472, 525 *Critical Thinking Challenges*, p. 528 *Applying the Concepts,* pp. 479, 487, 499, 508 *Extending the Concepts,* pp.482, 501, 510 *Data Projects*, p. 529 *TI-83/84 Step by Step*, pp. 482, 490, 502, 512
Domain: Making Inferences and Justifying Conclusions **Cluster:** Design and conduct a statistical experiment to study a problem, then interpret and communicate the outcomes. **S.IC.B.12** Use data from a randomized	**Objective(s)** The student will: • Test the difference between two-sample means for independent samples, using the t Test.	**Elementary Statistics Textbook (Bluman)** 9-2 Testing the Difference Between Two Means of Independent Samples: Using the t Test	

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **Domain:** Using Probability to Make Decisions **Cluster:** Understand and use discrete probability distributions. **S.MD.A.8** Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).		**Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Video: Z versus T Stat Trek: Hypothesis Testing; Difference Between Two Means Double Stuff?	
Domain: Making Inferences and Justifying Conclusions **Cluster:** Design and conduct a statistical experiment to study a problem, then interpret and communicate the outcomes. **S.IC.B.12** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **Domain:** Using Probability to Make Decisions **Cluster:** Understand and use discrete probability distributions. **S.MD.A.8** Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	**Objective(s)** The student will: • Test the difference between two means for independent samples, using the t Test.	**Elementary Statistics Textbook (Bluman)** 9-3 Testing the Difference Between Two Means: Dependent Samples (Matched Pairs) **Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Stat Trek: Hypothesis Testing; Difference Between Paired Means Which Hand Rules	
Domain: Making Inferences and Justifying Conclusions **Cluster:** Design and conduct a statistical	**Objective(s)** The student will: • Test the difference between two	**Elementary Statistics Textbook (Bluman)** 9-4 Testing the Difference Between Proportions	**Utilize Tasks to include the *Standards for Mathematical Practice* where students have to *reason, justify, explain, construct &***

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
experiment to study a problem, then interpret and communicate the outcomes. **S.IC.B.12** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **Domain:** Using Probability to Make Decisions **Cluster:** Understand and use discrete probability distributions. **S.MD.A.8** Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	proportions, using a z Test.	**Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Video: Comparing Population Proportions 1 Video: Comparing Population Proportions 2 Video: Hypothesis testing Comparing Population Proportions Stat Trek: Hypothesis Testing; Difference Between Proportions **Task(s)** Statistics -_SAT Performance II	***model* their thinking.**
Domain: Making Inferences and Justifying Conclusions **Cluster:** Design and conduct a statistical experiment to study a problem, then interpret and communicate the outcomes. **S.IC.B.12** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **Domain:** Interpreting Categorical and Quantitative Data **Cluster:** Understand, represent, and use bivariate data. **S.ID.B.10** Represent and analyze categorical data. **S.ID.B.11** Display and discuss bivariate data where at least one variable is categorical.	**Objective(s)** The student will: • Test two categorical variables for "goodness of fit", using a chi-square test.	**Elementary Statistics Textbook (Bluman)** 11-1 Test for Goodness of Fit **Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Stat Trek: Chi-Square Goodness of Fit Test Video: Chi-Square Goodness of Fit Test **Task(s)** Goodness of Fit Statistics – Animal Crackers	**Sections 11-1 through 11-2** **Vocabulary** Contingency table, expected frequency goodness-of-fit test, homogeneity of proportions test, independence test, observed frequency ***Elementary Statistics Textbook (Bluman)*** *Statistics Today*, pp. 590, 621 *Critical Thinking Challenges*, p. 623 *Applying the Concepts,* pp. 598, 611 *Extending the Concepts,* pp. 601, 615 *Data Projects*, p. 624

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
Domain: Making Inferences and Justifying Conclusions **Cluster:** Design and conduct a statistical experiment to study a problem, then interpret and communicate the outcomes. **S.IC.B.12** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **Domain:** Interpreting Categorical and Quantitative Data **Cluster:** Understand, represent, and use bivariate data. **S.ID.B.10**Represent and analyze categorical data. **S.ID.B.11** Display and discuss bivariate data where at least one variable is categorical.	**Objective(s)** The student will: • Test two categorical variables for independence, using a chi-square test. • Test two categorical variables for homogeneity, using a chi-square test.	**Elementary Statistics Textbook (Bluman)** 11-2 Tests Using Contingency Tables **Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Stat Trek: Chi-Square Test of Homogeneity Chi-Square Test of Homogeneity Video: Contingency table chi-square test **Task(s)** Statistics – M & Ms Chi Sq Indp The Case of the Careless ZooKeeper	*TI-83/84 Step by Step*, pp. 602, 624
Chapter 10 Correlation and Regression **(Allow approximately 3-4 weeks for instruction, review, and assessment)**			
Domain: Interpreting Categorical and Quantitative Data **Cluster:** Understand, represent, and use bivariate data. **S.IC.B.12**For bivariate measurement data, be able to display a scatterplot and describe its shape; use technological tools to determine regression equations and correlation coefficients. **S.ID.B.13** Identify trends in bivariate data; find functions that model the data and that transform the data so that they can be	**Essential Question(s):** • How do we make predictions and informed decisions based on current numerical information? • What are the advantages and disadvantages of analyzing data by hand versus by using technology? • What is the potential impact of making a decision from data that contains one or more outliers? **Objective(s)**	**Elementary Statistics Textbook (Bluman)** 10-1 Scatter Plots and Correlation **Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Against All Odds Videos & Lessons: Scatterplots Against All Odds Videos & Lessons: Correlation	**Sections 10-1 through 10-2** **Vocabulary** Correlation, correlation coefficient, dependent variable, extrapolation, independent variable Correlation, correlation coefficient, dependent variable, extrapolation, independent variable, multiple relationship, negative relationship, Pearson product moment, correlation coefficient, population correlation coefficient, positive relationship, regression, scatter plot, simple relationship, regression line

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
modeled.	The student will: • Construct and interpret a scatter plot for a set of bivariate data. • Compute the correlation coefficient.	Khan Academy: Scatterplots & Correlations **Task(s)** Statistics - Match Scatter I Statistics - Match Scatter II	***Elementary Statistics Textbook (Bluman)*** *Statistics Today*, pp. 534, 585 *Critical Thinking Challenges*, p. 586 *Applying the Concepts,* pp. 547, 558 *Extending the Concepts,* pp. 551, 560 *Data Projects*, p. 587 *TI-83/84 Step by Step*, p.562 **Utilize Tasks to include the *Standards for Mathematical Practice* where students have to *reason, justify, explain, construct & model* their thinking.**
Domain: Interpreting Categorical and Quantitative Data **Cluster:** Understand, represent, and use bivariate data. **S.ID.B.12** For bivariate measurement data, be able to display a scatterplot and describe its shape; use technological tools to determine regression equations and correlation coefficients. **S.ID.B.13** Identify trends in bivariate data; find functions that model the data and that transform the data so that they can be modeled.	**Objective(s)** The student will: • Compute the equation of the regression line.	**Elementary Statistics Textbook (Bluman)** 10-2 Regression **Additional Resource(s)** Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.) Against All Odds Videos & Lessons Khan Academy: Regression STatistics Education Web **Task(s)** Statistics- M&Ms 4 Statistics-Monopoly Statistics-Hand Span Statistics- M&Ms 5	

RESOURCE TOOLBOX		
Textbook Resources Elementary Statistics 7th edition Bluman (PowerPoints, Chapter PDF files, Solutions Manual, etc.)	**Standards** Common Core Standards - Mathematics Common Core Standards - Mathematics Appendix A The Mathematics Common Core Toolbox Link to common core glossary TN Math Standards	**Videos** Against All Odds Videos (with Study Guides) (A Video Series that introduces a statistical topic and illustrates it with a real-world example) Khan Academy
Calculator Texas Instruments Education http://www.casioeducation.com/educators	**Interactive Manipulatives** Stat Trek AmStat.org Applet Collection	**Additional Sites** The Data and Story Library Fed Stats Bureau of Labor Statistics Educational Statistics NCTM Math Illuminations United States Census Bureau **ST**atistics **E**ducation **W**eb Mathematics Vision Project: Modeling Data Georgia Standards of Excellence: Unit 9 Probability Georgia Standards of Excellence: Unit 8: Inferences & Conclusions from Data
	ACT TN ACT Resources ACT College & Career Readiness Mathematics Standards	