## Introduction

In 2014, the Shelby County Schools Board of Education adopted a set of ambitious, yet attainable goals for school and student performance. The District is committed to these goals, as further described in our strategic plan, Destination2025. **By 2025,**

## 80% of our students will graduate from high school college or career ready

* **90% of students will graduate on time**
* **100% of our students who graduate college or career ready will enroll in a post-secondary opportunity**

In order to achieve these ambitious goals, we must collectively work to provide our students with high-quality, College and Career Ready standards-aligned instruction. Acknowledging the need to develop competence in literacy and language as the foundation for all learning, Shelby County Schools developed the Comprehensive Literacy Improvement Plan (CLIP). The CLIP ensures a quality balanced literacy approach to instruction that results in high levels of literacy learning for all students across content areas. Destination 2025 and the CLIP establish common goals and expectations for student learning across schools.

CLIP connections are evident throughout the mathematics curriculum maps.

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. College and Career Ready Standards are rooted in the knowledge and skills students need to succeed in post- secondary study or careers.

While the academic standards establish desired learning outcomes, the curriculum provides instructional planning designed to help students

reach these outcomes. Educators will use this guide and the standards as a roadmap for curriculum and instruction. The sequence of learning is strategically positioned so that necessary foundational skills are spiraled in order to facilitate student mastery of the standards.

These standards emphasize thinking, problem-solving and creativity through next generation assessments that go beyond multiple-choice tests to increase college and career readiness among Tennessee students. In addition, assessment blueprints (<http://www.tn.gov/education/article/tnready-blueprints> ) have been designed to show educators a summary of what will be assessed in each grade, including the approximate number of items that will address each standard. Blueprints also detail which standards will be assessed on Part I of TNReady and which will be assessed on Part II.

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| Our collective goal is to ensure our students graduate ready for college and career. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation and connections. |  |
|  | The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up:* adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations) procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics and sensible, useful and worthwhile, coupled with a belief in diligence and one’s own efficacy). Throughout the year, students should continue to develop proficiency with the eight Standards for Mathematical Practice. |

## How to Use the Mathematic Curriculum Maps

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. To reach our collective student achievement goals, we know that teachers must change their instructional practice in alignment with the three College and Career Ready shifts in instruction for Mathematics. We should see these shifts in all classrooms:

## Focus

1. **Coherence**
2. **Rigor**

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 each of the three shifts that teachers should consistently access:

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| **The TNCore Mathematics Standards** | |
| **The Tennessee Mathematics Standards:** [**https://www.tn.gov/education/article/mathematics-**](https://www.tn.gov/education/article/mathematics-standards)[**standards**](https://www.tn.gov/education/article/mathematics-standards) | Teachers can access the Tennessee State standards, which are featured throughout this curriculum map and represent college and career ready learning at reach respective grade level. |
| **Mathematical Shifts** | |
| **Focus**  [**http://achievethecore.org/shifts-mathematics**](http://achievethecore.org/shifts-mathematics) | The standards are focused on fewer topics so students can learn more |
| **Coherence**  [**http://achievethecore.org/shifts-mathematics**](http://achievethecore.org/shifts-mathematics) | Topics within a grade are connected to support focus, and learning is built on understandings from previous grades |
| **Rigor**  [**http://achievethecore.org/shifts-mathematics**](http://achievethecore.org/shifts-mathematics) | The standards set expectations for a balanced approach to pursuing conceptual understanding, procedural fluency, and application and modeling |

**Curriculum Maps:**

* Locate the TDOE Standards in the left column. Analyze the language of the standards and match each standard to a learning target in the second column.
* Consult your *Tennessee Finite Math by Maki and Thompson* Teachers’ Edition (TE) and other cited references to map out your week(s) of instruction.
* Plan your weekly and daily objectives, using the standards' explanations provided in the second column. Best practices tell us that making objectives measureable increases student mastery.
* Carefully review the web-based resources provided in the 'Content and Tasks' column and use them as you introduce or assess a particular standard or set of standards.
* Review the CLIP Connections found in the right column. Make plans to address the content vocabulary, utilizing the suggested literacy strategies, in your instruction.
* Examine the other standards and skills you will need to address in order to ensure mastery of the indicated standard.
* Using your McGraw-Hill TE and other resources cited in the curriculum map, plan your week using the SCS lesson plan template. Remember to include differentiated activities for small-group instruction and math stations.

| **TN State Standards** | **Essential Understandings** | **Content & Tasks** | **Literacy Connections** |
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| **Chapter 8**  **(Allow 3 weeks for instruction, review, and assessment)** | | | |
|  | 8-1 States, Transitions, Transition   * Diagrams, and Transition Matrices | Tennessee Finite Math Textbook  See [SCS Math Tasks (Finite Math)](http://www.scsk12.org/uf/ci/mathtask.php?action=4) |  |
| [A-LM](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  6. Use Markov Chains to solve problems. | 8-2 Basic Properties of Markov Chains | Tennessee Finite Math Textbook | **Writing**  Markov Chains are used in many different fields. Student should research Markov Chains and write about several examples that you found. |
| [A-LM](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  6. Use Markov Chains to solve problems. | 8-3 Regular Markov Chains | Tennessee Finite Math Textbook  [**FiniteMathActivity\_MarkovChains**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388) |  |
| [A-LM](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  6. Use Markov Chains to solve problems. | 8-4 Absorbing Markov Chains (OPTIONAL) | Tennessee Finite Math Textbook |  |
| **Transcendental Functions**  **(Allow 2 weeks for instruction, review, and assessment)** | | | |
| [F-TF](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  1. Describe transcendental functions through various representations, including words, equations, tables, and graphs; discuss how they are used in modeling contextual situations.  [F-TF](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  2. Use the language and notation of functions to develop models of real-world phenomena.  [F-TF](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  3. Analyze the effect of changing various parameters on transcendental functions and their graphs  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  9. Know when to use transcendental functions to accomplish various application purposes such as predicting population growth. | 3-1 Exponential Functions   * Evaluate, analyze and graph exponential functions. * Solve problems involving exponential growth and decay. | Glencoe Precalculus McGraw-Hill 2011  Chapter 3  [**FiniteMathActivity\_ExponentialGrowth**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388) | **Writing**  Give students two or three exponential growth and decay equations. Have them tell if their equation represents growth or decay and why. |
| [A-EL](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  1. Define logarithms.  [A-EL](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  3. Understand the relationships between exponential and logarithmic expressions.  [F-TF](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  2. Use the language and notation of functions to develop models of real-world phenomena.  [F-TF](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  3. Analyze the effect of changing various parameters on transcendental functions and their graphs. | 3-2 Logarithmic Functions   * Evaluate expressions involving logarithms. * Sketch and analyze graphs of logarithmic functions | Glencoe Precalculus McGraw-Hill 2011 Chapter 3  [**FiniteMathActivity\_ExpLog**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388) | **Writing**  Compare and contrast the large-scale behavior of exponential and logarithmic functions with base *b* for *b* = 2, 6, and 10. |
| [A-EL](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  2. Use properties of logarithms to expand and condense logarithmic expressions.  [F-TF](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  2. Use the language and notation of functions to develop models of real-world phenomena.  [A-EL](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  3. Understand the relationships between exponential and logarithmic expressions.  [A-EL](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  4. Use exponential and logarithmic relationships to model, predict, and solve contextual problems. | 3-3 Properties of Logarithms   * Apply properties of logarithms. * Apply the Change of Base Formula. | Glencoe Precalculus McGraw-Hill 2011 Chapter 3  [Engage](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-overview)[ny](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-overview) [Algebra II Module 3, Topic C,](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-overview) **[Exponential & Logaritmic Functions](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-overview)**  [Lesson 17: Graphing the Logarithmic Function](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-lesson-17)  [Lesson 18: Graphs of Exponential Functions and Logarithmic Functions](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-lesson-18)  [Lesson 19: The Inverse Relationship between Logarithmic and Exponential Functions](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-lesson-19)  [Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-lesson-20)  [Lesson 21: The Graph of the Natural Logarithm Function](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-lesson-21)  [Lesson 22: Choosing a Model](https://www.engageny.org/resource/algebra-ii-module-3-topic-c-lesson-22) | **Writing**  Students should research natural occurrences in our world which utilize logarithms to measure or describe what is occurring. Have students write about their findings including how logarithms relate to the occurrence and any formulas that are used. |
| **Chapter 9**  **(Allow 3 weeks for instruction, review, and assessment)** | | | |
| [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  1. Define interest, compound interest, annuities, sinking funds, amortizations, annuities, future value and present value. [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  7. Apply arithmetic and geometric sequences to simple and compound interest, annuities, loans, and amortization.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  8. Solve problems in mathematics of finance involving compound interest using exponential and logarithmic techniques. | 9-1 Interest | Tennessee Finite Math Textbook  [**FiniteMathTask\_CompoundInterest**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388) | **Discussion**  Have students discuss the difference between annual, monthly or daily compounding. |
| [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  1. Define interest, compound interest, annuities, sinking funds, amortizations, annuities, future value and present value.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  3. Determine future value and present value of an annuity.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  7. Apply arithmetic and geometric sequences to simple and compound interest, annuities, loans, and amortization.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  8. Solve problems in mathematics of finance involving compound interest using exponential and logarithmic techniques. | 9-2 The Present Value of Future Payments | Tennessee Finite Math Textbook  [**FiniteMathActivity\_Bonds**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388) | **Writing**  How can being financially literate help you to make good decisions? Give an example. |
| [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  1. Define interest, compound interest, annuities, sinking funds, amortizations, annuities, future value and present value.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  4. Determine the amortization schedule for an annuity and a home mortgage. | 9-3 Time Payment, Amortization, and Mortgages | Tennessee Finite Math Textbook  [**FiniteMathTask\_Amortization**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388) |  |
| [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  2. Recognize the importance of applying a financial model to business.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  5. Apply financial mathematics to depreciation schedules.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  6. Solve contextual problems involving financial decision-making.  [N-NQ](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  10. Use orders of magnitude estimates for determining an appropriate model for a contextual situation. | 9-4 Evaluating Investment Options and Financial Decision Making | Tennessee Finite Math Textbook | **Writing**  How can being financially literate help you to make good decisions? Give an example. |
| **Apportionment**  **(Allow 1 week for instruction, review, and assessment)** | | | |
| [G-A](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  2. Discuss the differences between two different types of apportionment and construct an example illustrating them.  [G-A](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  3. Compare apportionments between states and the validity of the resulting representations. | C-1 Different Types of Apportionment | Tennessee Finite Math Textbook  Appendix C  [**FiniteMathPPT\_Apportionment**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388)  [**FiniteMath\_ApportionmentApplet**](http://www.scsk12.org/uf/webadmin/foundation/ci/task?PID=388) | **Discussion**  Have students discuss how mathematics is connected to apportionment and give examples. |
| [G-A](http://www.tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  1. Understand the mathematical basis of apportionment principles and paradoxes | C-2 Apportionment Flaws | Tennessee Finite Math Textbook  Appendix C |  |

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| **RESOURCE TOOLBOX** | | |
| **Textbook Resources**  Tennessee Finite Math  by Dan Maki and Maynard Thompson  Published by McGraw Hill 2011  [**http://interactmath.com/**](http://interactmath.com/) | **Standards**  [Common Core Standards - Mathematics](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf)  [Common Core Standards - Mathematics Appendix A](http://www.corestandards.org/assets/CCSSI_Mathematics_Appendix_A.pdf)  [TN Core](http://tncore.org/math.aspx)  [The Mathematics Common Core Toolbox](http://www.ccsstoolbox.org/)  [***Link to common core glossary***](http://www.corestandards.org/Math/Content/mathematics-glossary/glossary/)  [State Academic Standards (Finite Math)](http://tn.gov/assets/entities/education/attachments/std_math_senior_finite_math.pdf)  [TN Department of Education Math Standards](http://state.tn.us/education/standards/math.shtml) | **Videos**  [Khan Academy](https://www.khanacademy.org/)  [Illuminations (NCTM)](http://illuminations.nctm.org/)  [Discovery](http://discoveryeducation.com) Education  [The Futures Channel](http://thefutureschannel.com/#loaded)  [The Teaching Channel](https://www.teachingchannel.org/)  [Teachertube.com](http://www.teachertube.com) |
| **Calculator**  [Texas Instruments Education](http://education.ti.com/en/us/activity/search/subject)  [TI-Nspired](http://education.ti.com/en/timathnspired/us/home)  [**http://www.atomiclearning.com/ti\_84**](http://www.atomiclearning.com/ti_84)  **[TICommonCore.com](http://education.ti.com/en/us/solutions/common-core-state-standards" \t "_blank)**  <http://www.casioeducation.com/educators> | **Interactive Manipulatives**  [Rossmanchance.com](http://www.rossmanchance.com/applets/) | **Additional Sites**  [NCTM Math Illuminations](http://illuminations.nctm.org/LessonDetail.aspx?id=L780)  [Core Math Tools](http://www.nctm.org/resources/content.aspx?id=32702)  [Math is Fun](http://www.mathsisfun.com/data/#stats)  [Wolfram Math World](http://mathworld.wolfram.com/topics/ProbabilityandStatistics.html)  [Nrich](https://nrich.maths.org/frontpage)  [SCS Math Tasks (Finite Math)](http://www.scsk12.org/uf/ci/mathtask.php?action=4) |
| **CLIP**  [**Glencoe Reading & Writing in the Mathematics Classroom**](http://www.glencoe.com/sec/teachingtoday/downloads/pdf/ReadingWritingMathClass.pdf)  [**Graphic Organizers (9-12)**](https://www.teachervision.com/tv/tvsearch/site=TV&lowest_grade=109&highest_grade=112&type=graphic-organizer)  [**Graphic Organizers (dgelman)**](http://www.dgelman.com/graphicorganizers/#EQUATIONS)  [**Literacy Skills and Strategies for Content Area Teachers**](http://www.valrc.org/resources/docs/MHS_Literacy_Strategy_Book.pdf) |  |  |