

TRANSITION TO COLLEGE MATHEMATICS AND STATISTICS

Preparing Fourth-Year High School Math Students
for College, Career, and Real-World Success

Program Overview

Transition to College Mathematics and Statistics

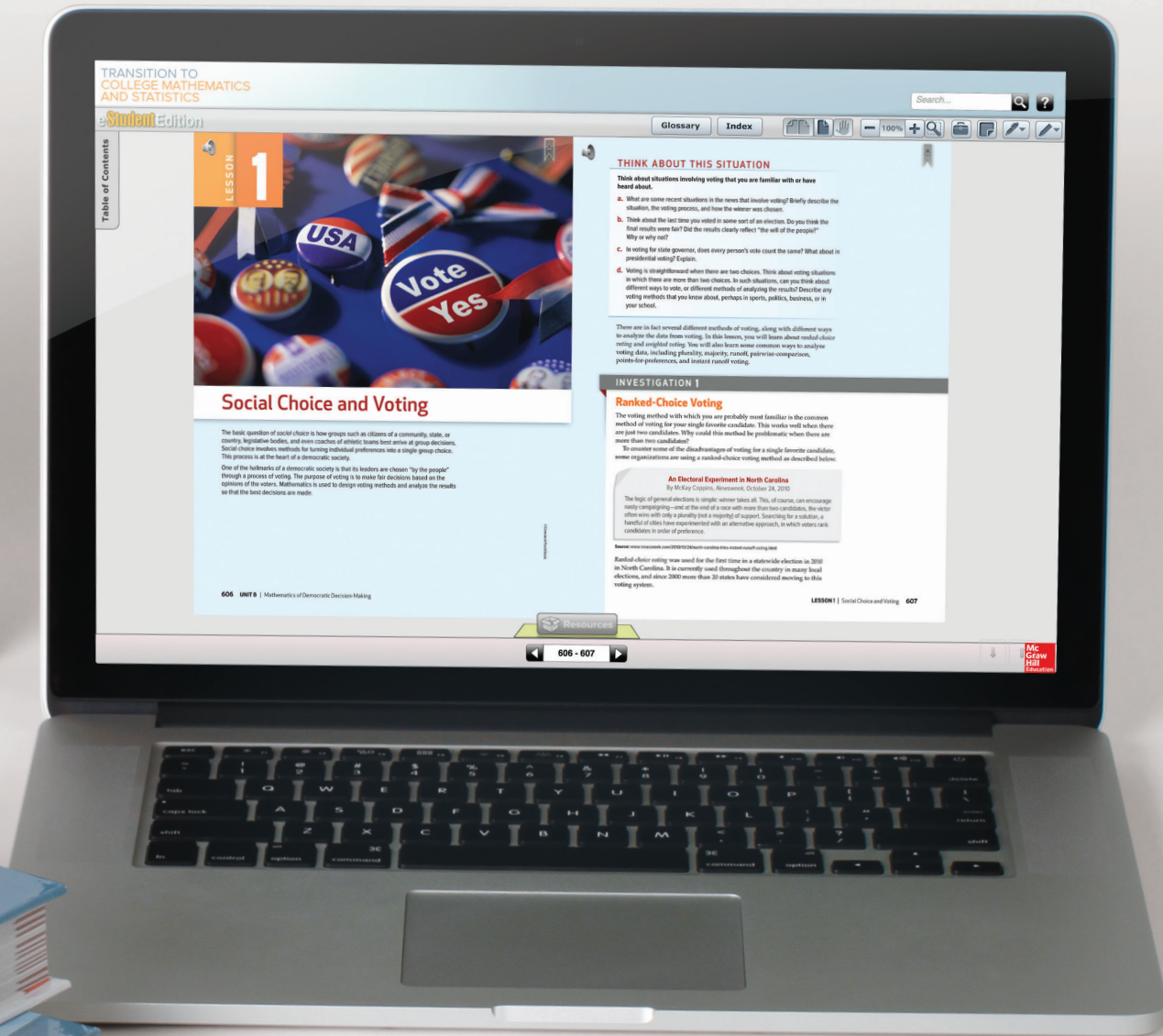
A Fourth Year Mathematics Course

Transition to College Mathematics and Statistics (TCMS) is a fourth-year capstone mathematics course designed for students entering the workforce or pursuing non-STEM college degree programs upon graduation. The *TCMS* program provides a student-centered curriculum that focuses on real-world problems, encourages active engagement, and fosters problem solving skills—providing a solid foundation for success in college, career, and daily life.



Developed with funding from the National Science Foundation (NSF), the *TCMS* curriculum focuses on four major branches of mathematical science and is intended to target the core competencies required for career readiness and college placement tests.





TCMS curriculum is available in print, digital, and blended formats to meet your instructional needs today, tomorrow, and beyond.



Q

Mrs. Smith is a high school teacher. She's searching for a fourth-year math course for her college-bound students who aren't interested in taking Precalculus or AP courses. What are her options?

A

Problem-Based Learning

The *TCMS* program is a perfect fit. Student-oriented, problem-based learning will engage her students — reinforcing and building the math skills they need to perform well on college placement tests. The four-phase instructional cycle will guide her students through the learning process to build their conceptual understanding of mathematics, positioning them for college success.

Active Learning for Today’s World

Incorporating hands-on, group collaboration, the *TCMS* curriculum encourages students to become responsible and highly engaged in their learning while developing 21st century skills needed for college and careers.

Explore the Four-Phase Instructional Cycle

The *TCMS* program is designed around an instructional model informed by theory and research on teaching and learning. Units support sense-making and reasoning in mathematics through a four-phased instructional cycle. This method of instruction engages students in a way that encourages analysis, abstraction, and a deeper understanding of mathematical ideas and their application in real life.

The graphic illustrates the four phases of the instructional cycle. Phase 1, 'Launch', is titled 'THINK ABOUT THIS SITUATION' and includes a 'LESSON 1' label. Phase 2, 'Explore', is titled 'INVESTIGATION'. Phase 3, 'Share & Summarize', is titled 'SUMMARIZE THE MATHEMATICS'. Phase 4, 'Self-Assess', includes 'CHECK YOUR UNDERSTANDING' and 'HOMEWORK'. Each phase has a corresponding text box with lines for student input and a red circular icon with the phase number and name.

1 Launch Think About This Situation

An introductory problem situation sets the context for class investigations to follow and provides important information on students’ prior knowledge.

2 Explore Group Investigation

Student teams investigate and reason through problem situations posed by the launch scenario.

3 Share & Summarize Summarize the Mathematics

Teacher-led discussion to guide student groups as they summarize their mathematical ideas and construct a shared understanding of concepts, methods, and supporting justifications.

4 Self-Assess Check Your Understanding, Homework

A Check Your Understanding task and assigned homework tasks provide important formative assessment for students and their teachers.



Q

Marin is a high school senior. She needs a fourth year of math to be accepted into the college elementary teacher program of her choice, but Precalculus and AP Statistics intimidate her. Is there an alternative?

A

Modern & Relevant Curriculum

A *TCMS* course is Marin's best choice, presenting real-world, relatable mathematics situations that will allow her to work through solutions in a manner that is modern and relevant. She'll fulfill her four-year math requirement and deepen her mastery of mathematical concepts with a course grounded in mathematical modeling and supported by technology that enhances her learning experience.

Emphasis on Mathematical Modeling

The design of the *TCMS* curriculum engages students in the mathematical modeling process and encourages the development of mathematical behaviors emphasized in the CCSS Standards of Mathematical Practice. Student interest is cultivated with:

- Relatable, real-world problems and situations
- A collaborative, problem-solving model
- Instruction that fosters the connection of mathematical concepts

Integrated with Technology

The *TCMS* curriculum is designed to take advantage of the power and potential of technology to support students as well as teachers. Content is available in online and mobile formats and is paired with digital resources including McGraw-Hill eAssessment and *TCMS-Tools*® software. These technological resources:

- Support and enhance the learning and instructional process.
- Develop mathematical thinking and problem-solving.

ConnectED resources include TCMS-Tools® which provides dynamic, interactive student support.

TCMS ebook is accessible in a desktop format as well as ConnectED Mobile.

Teachers can communicate assignments and instruction through ConnectED - anytime, anywhere.



Q

Tad is a senior who's completed his math requirements for graduation. He has his sights set on pursuing Political Science in college and thinks a fourth year of math isn't important. Should he reconsider his decision?

A

College & Career Preparation

The *TCMS* program is for students like Tad who are either pursuing non-STEM degrees or entering career-training programs. It develops group collaboration, communication, and justification skills that are vital for his college and career preparation. Although Tad plans to study Political Science, he'll need to qualify for a credit bearing college mathematics course. The *TCMS* program will prepare Tad for a strong performance on the college mathematics placement test.

Target Core Competencies

The *TCMS* program prepares students for college success by further developing and solidifying concepts students developed in previous mathematics courses (Number and Quantity, Algebra, Functions, and Geometry). The incorporation of College Readiness Assessment (CRA) tasks within the *TCMS* program builds skills in the core competencies assessed on many college placement tests—providing valuable practice and guidance on successful test-taking strategies.

Mathematics in Context

The *TCMS* program helps students develop a deep understanding of mathematical practices and provides opportunities to apply advanced mathematics in a wide range of contexts. Lessons help students make connections between mathematical concepts and real world challenges, sharpening their problem solving and everyday mathematics reasoning skills for college and the workplace. The *TCMS* program features eight units of mathematical topics to challenge and interest students.

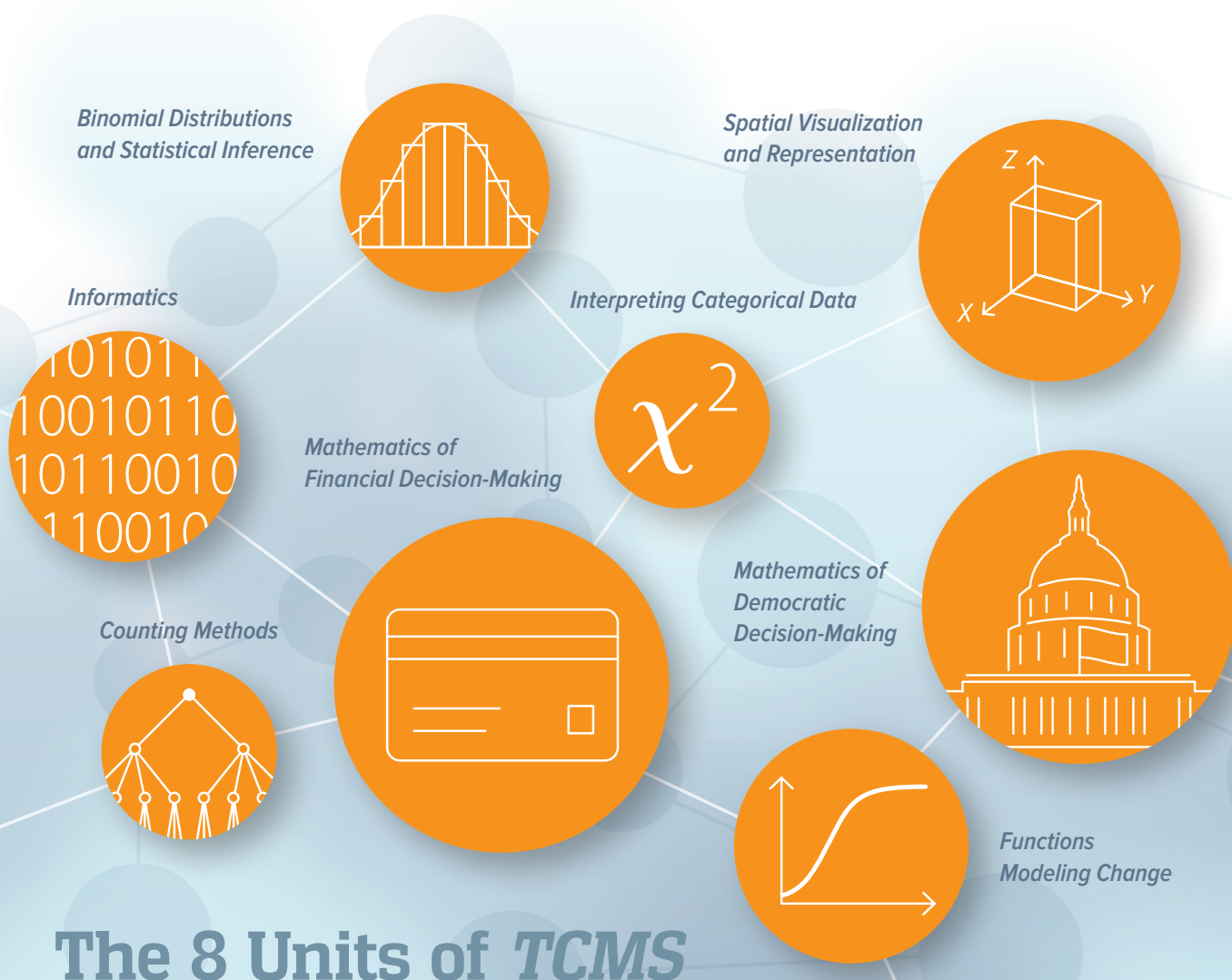


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UNIT 1 Interpreting Categorical Data

Develops student understanding of two-way frequency tables, conditional probability and independence, and the use of data from a randomized experiment to compare two treatments.

UNIT 2 Functions Modeling Change

Extends student understanding of linear, exponential, quadratic, power, circular, and logarithmic functions to model quantitative relationships and data patterns with graphs that are transformations of basic patterns.

UNIT 3 Counting Methods

Extends student ability to count systematically and solve enumeration problems using permutations and combinations.

UNIT 4 Mathematics of Financial Decision-Making

Teaches students financial concepts using functions, expressions, and equations that are presented in linear, exponential, and logarithmic formats that represent the mathematical relationships in financial models.

UNIT 5 Binomial Distributions and Statistical Inference

Develops student understanding of the rules of probability; binomial distributions; expected value; testing a model; simulation; making inferences about the population based on a random sample; margin of error; and comparison of sample surveys, experiments, and observational studies and how randomization relates to each.

UNIT 6 Informatics

Develops student understanding of the mathematical concepts and methods related to information processing, particularly on the Internet, by focusing on the key issues of access, security, accuracy, and efficiency.


UNIT 7 Spatial Visualization and Representations

Extends student ability to visualize and represent three-dimensional shapes using contour diagrams, cross sections, and relief maps. Presents coordinate methods for representing and analyzing three-dimensional shapes and their properties. Uses graphical and algebraic reasoning to solve systems of linear equations, inequalities in three variables, and linear programming problems.

UNIT 8 Mathematics of Democratic Decision-Making

Develops student understanding of the mathematical concepts and methods that are used to make decisions regarding voting and fair division in a democratic society.

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mheonline.com/tcms



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