Course Options

With the emphasis on students understanding mathematical concepts and achieving deeper learning, teachers will teach mathematics differently than in the past. Students will learn to "do math" through real-world situations and focus on fewer, more connected topics presented in a coherent progression that leads to readiness for college, careers, and civic life.

The higher mathematics standards are organized into model courses from two pathways that over three courses cover all the same standards but in a slightly different order. The model courses in the integrated pathway are Mathematics I, II, and III; the model courses in the traditional pathway are Algebra I, Geometry, and Algebra II. Generally, students take these higher mathematics courses in grades 9–12, though some students begin taking them in middle school.

In addition, there are four advanced courses: Precalculus, Statistics and Probability, Calculus, and Advanced Placement Probability and Statistics. Local school districts determine which courses to offer their students.

▶ Talk with your student about the mathematics you use every day (computing gas mileage or the cost of an item after the sales tax is added, calculating the interest paid on a credit card bill, comparing the costs of cell phone plans).

▶ Discuss with your student how mathematics is used to develop possible solutions to real-world issues.

▶ The Common Core Resources Web page is online at http://www.cde.ca.gov/re/cc/. Start by clicking on the Students/Parents tab.

▶

What Your Student Will Learn:

California Common Core State Standards for Mathematics

Thinking Like a Mathematician

The Standards for Mathematical Practice (MP) help students learn to think like mathematicians—to reason quantitatively, use technology and other tools strategically, identify patterns that help them solve problems, and explain and defend both their answers and the reasoning they used to find them. Modeling with mathematics, MP.4, is emphasized in higher mathematics courses as students use mathematical tools and methods to ask and answer questions about real-world situations.

Example of Modeling and Functions

Students apply functional reasoning to model real-world situations, such as investigating rates of change and patterns of growth. This example from Mathematics I and Algebra I illustrates the type of problems related to patterns of growth that students may face after they have worked with basic exponential functions:

On June 1, a fast-growing species of algae is accidentally introduced into a lake in a city park. It starts to grow and cover the surface of the lake in such a way that the area covered by the algae doubles every day. If the algae continue to grow unabated, the lake will be totally covered, and the fish in the lake will suffocate. Based on the current rate at which the algae are growing, this will happen on June 30.

Write an equation that represents the percentage of the surface area of the lake that is covered in algae, as a function of time (in days) that passes since the algae were introduced into the lake.

Example of Geometric Transformations

Geometric transformations are given a more prominent role in the geometry curriculum than in the past. Students in either Mathematics I or Geometry will use informal proofs, such as the one presented here, to explain geometric concepts.

Point A is translated to D, the resulting image of $\triangle AB$

Statistics and probability is another important topic in higher mathematics and one that students can apply to real-world situations. For example, students in Mathematics II or Geometry explore probabilities and are able to draw on their knowledge to answer questions such as whether being a passenger in first class increased the chances of surviving the sinking of the RMS *Titanic*.

	D	
First-class passengers	202	123	325
Second-class passengers	118	167	285
Third-class passengers	178	528	706
	498	818	1,316