

High Ability Students and the Utah Mathematics Core Standards

Utah's Core State Standards are designed to meet the requirements of career- and college-readiness for all students. The standards define what students should know and be able to do at each grade level. They are aligned with college and career expectations and include rigorous content and application of knowledge through high-order skills. The standards provide both the challenge and the depth necessary for all students to engage meaningfully in mathematics.

The standards are rigorous and become more complex beginning in Kindergarten. By the end of eleventh grade students will have the quantitative skills they need for post-secondary work and study. Each grade features the study of topics in depth and examines the interrelationships among mathematics concepts. The core's structure allows more flexibility to accelerate learning for students as they progress through their secondary education.

There are some students who will be ready to move through the mathematics more quickly or who will require additional rigor to challenge their abilities. "Students who are capable of moving more quickly deserve thoughtful attention, both to ensure that they are challenged and that they are mastering the full range of mathematical content and skills—without omitting critical concepts and topics." (CCSS, Appendix A, 80) The core includes honors courses beginning in seventh grade and will provide higher level math courses such as AP Calculus or AP Statistics available for students who are ready for them.

The Core encourages an implementation that builds solid foundations in mathematics understanding and skill in the elementary grades, stating, "Placing students into tracks too early should be avoided at all costs. It is not recommended to compact the standards before grade seven." (CCSS, Appendix A, 81). In grades K-6, the needs of high ability learners can most often be met through the addition of depth and complexity to the core standards. Teachers should use instructional methods that allow students to delve deeper into mathematics through tasks that are accessible to all, encourage extended thinking and develop advanced depth of knowledge. For the few students who have a particularly high aptitude for mathematics schools should carefully evaluate mathematical ability using a minimum of three valid and reliable assessment instruments and consider the long term consequences of a compacted or telescoped mathematics program, including the availability of continued support in subsequent grades.

In seventh and eighth grade, honors courses will contain extra topics not included in the core. These topics include elements from discrete mathematics, non-traditional geometries, different counting systems, and other mathematics that would be interesting to advanced middle school students. In addition, students in the honors courses will have increased opportunities to model contextual

situations with the mathematics at their grade level. These courses have increased rigor and advanced content that will challenge the minds of high ability students.

Students on the regular pathway will be prepared for Precalculus, A.P. Statistics, or concurrent enrollment in their senior year. The accelerated pathway to advanced placement calculus in high school is a compacted version of Secondary I, II, III and Precalculus and will begin in ninth grade. This pathway will allow students successfully completing the three high school honors courses to be ready for A.P. Calculus as seniors. This option is supported by the Mathematics Task Force, consisting of Utah mathematics educators from public and higher education, policy makers, and other stakeholders.

Additional choices and flexibility have been built into the new secondary mathematics core. If high ability students have difficulty they may exit the honors program at any time and take the regular Secondary I, II, or III courses, without being forced to repeat coursework. Schools may allow students to take some courses simultaneously, double block mathematics courses into semesters, or offer summer courses that bridge gaps and provide for greater acceleration.

In rare circumstances, an LEA may telescope mathematics courses to allow an especially advanced student to take Calculus before their senior year. Extreme care must be taken to properly identify and verify that these students are eligible and ready for such acceleration. "Serious efforts must be made to consider solid evidence of student learning in order to avoid unwittingly disadvantaging the opportunities of particular groups of students" (Common Core, Appendix A, 81). To be college and career ready, students need to show mathematics competency when they graduate. Please be sure to read the mathematics competency board rule R277-700-9, which can be found here: <http://www.schools.utah.gov/law/Administrative-Rules.aspx>. With thoughtful and informed placement and curricular decisions, students can be guided and placed in appropriate classes.

Accelerated courses must not skip any content or reduce rigor. Instead, they should move at a faster pace and include multiple assessments to ensure content has been mastered. LEA's and schools should use course codes that match the curriculum students are studying, even if that means using multiple course codes within a year. Guidelines for setting up compacted courses should include delayed selection of students (not starting prior to seventh grade), three valid assessments to demonstrate student readiness, structure that does not skip content or reduce rigor, and timeline planned so students take the appropriate SAGE assessment (even if this means more than one SAGE assessment in a given year). For example, compacting Seventh grade, Eighth grade, and Secondary I Honors over two years should have a plan for when students are enrolled in each course and when they would take each of the three SAGE assessments. Since the Honors standards in Secondary Mathematics I, II, and III correspond to all Precalculus standards, LEA's should proceed with caution in the implementation of compacted courses and collect data to validate the efficacy of such programs.