

Iowa Academic Standards for Mathematics

Model High School Course Pathways SCED Codes

Purpose

This document supports districts, school leaders, counselors, and educators in understanding how Iowa's high school mathematics pathways align with the Iowa Academic Standards for Mathematics and the School Courses for the Exchange of Data (SCED) codes. It is intended to support course catalog development, student planning, and transcript reporting while ensuring access to rigorous and coherent mathematics learning opportunities. This document is intended to support clarity, coherence, and local decision-making as districts design high school mathematics course offerings aligned to Iowa's standards and student goals.

Overview

Iowa's high school mathematics pathways are designed to support a coherent progression of mathematical learning aligned to students' interests and postsecondary goals. The pathways differ in mathematical emphasis while maintaining shared access to required standards.

The three pathways emphasize distinct mathematical priorities:

- **Pathway 1: Quantitative Reasoning Pathway (All Careers)**
Emphasizes quantitative literacy, proportional reasoning, mathematical modeling, and the application of mathematics in real-world contexts across a broad range of career pathways.
- **Pathway 2: Statistics Pathway (Life Science, Social Science, Health Care, Business, and Technical Careers)**
Emphasizes data analysis, modeling, and statistical reasoning to interpret data and make informed decisions.
- **Pathway 3: Calculus Pathway (Engineering and Physical Science Careers)**
Emphasizes advanced algebraic reasoning, trigonometric and precalculus concepts, limits, and calculus to support the mathematical demands of engineering and physical science fields.

Course–Pathway Alignment

The table below illustrates how core high school mathematics courses align with Iowa's three pathways.

Pathways 1 and 2 include all required high school mathematics standards listed on pages 108–111 of the Iowa Academic Standards for Mathematics. These standards are organized into course bundles for Algebra 1, Geometry, and Algebra 2. Pathway 3 includes these same required standards plus 50+ additional standards connected to advanced trigonometry and precalculus concepts. For this reason, Algebra 2+ replaces Algebra 2 in Pathway 3. Identification and implementation of these additional standards are determined locally, allowing districts to decide how best to incorporate them within their instructional context.

Districts are encouraged to rely on their high-quality instructional materials (HQIM) when bundling standards into courses. Standards should not be rearranged locally to match the model, as doing so would disrupt coherence, learning progressions, and trajectories embedded within instructional materials.

Mathematics Course Alignment Across High School Pathways

Course	Pathway 1: All Careers (Quantitative Reasoning)	Pathway 2: Life Science, etc. (Statistics)	Pathway 3: Engineering (Calculus)
Algebra 1	✓	✓	✓
Geometry	✓	✓	✓
Algebra 2	✓	✓	
Algebra 2 + (Advanced Trigonometry & Algebra Topics)			✓

High School Mathematics Course Pathways (Model)

- The model course pathways shown below—also included on page 99 of the Iowa Academic Standards for Mathematics—illustrate a way districts might organize required high school mathematics standards into course bundles across grades 9–12. These models are provided to support planning and conversation, not to prescribe course sequences.
- The reduced number of required standards in Pathways 1 and 2 supports implementation of the first instructional shift—Focus—as described in the Iowa Academic Standards for Mathematics. This encourages districts to allocate the majority of instructional time to the major clusters within the required high school standards.
- Districts may choose to implement Integrated Mathematics 1–3 in place of the traditional sequence of Algebra 1, Geometry, and Algebra 2 across any pathway. In some cases, students planning to pursue Calculus may need an additional Trigonometry or Precalculus course, as indicated by the dashed line in the model.
- This model is intended as a planning tool. Districts are encouraged to lean into their HQIM and local context when determining how best to bundle standards into courses that meet student needs.

Key for superscripts in the image below:

¹ Geometry standards include algebraic content that reinforces continuity across the pathway.

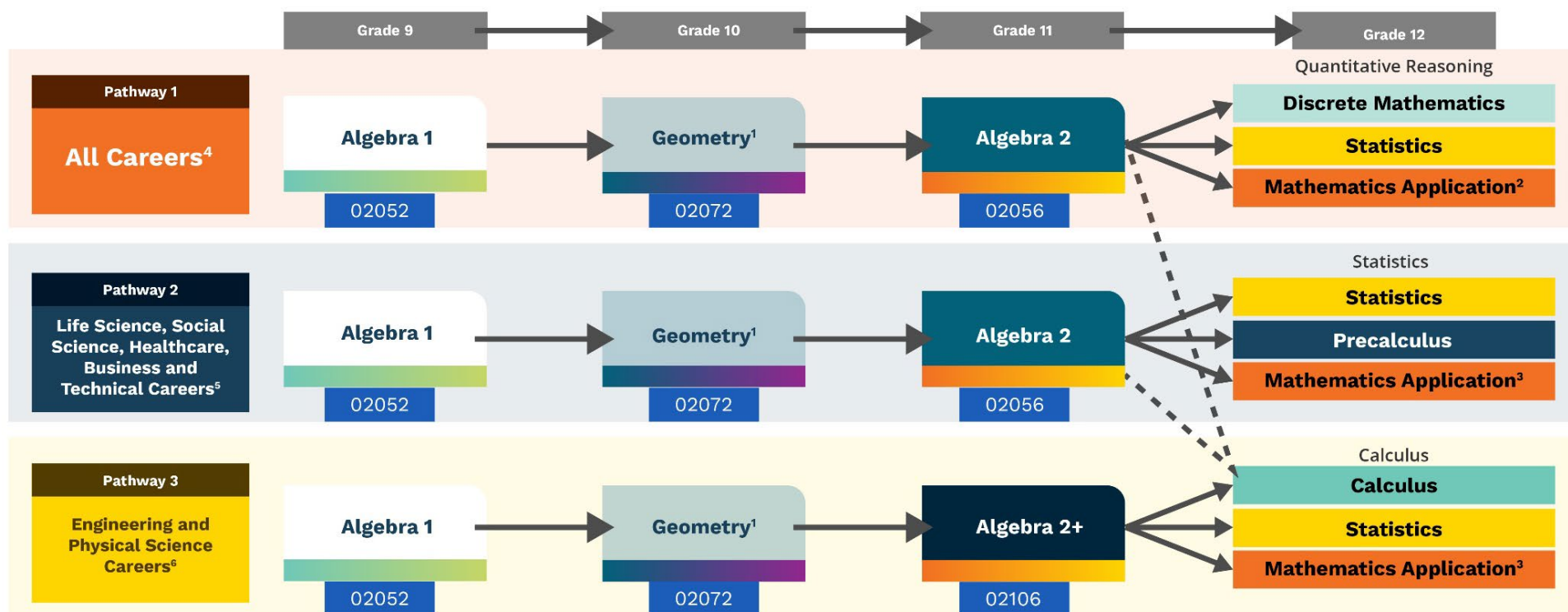
² Examples include Mathematics in Trades/Careers or Financial Algebra.

³ Examples include Data Science, Advanced Mathematical Modeling, or Discrete Mathematics.

⁴ Students in Pathway 1 may transition to the Calculus Pathway during the senior year with an appropriate bridge course.

⁵ Students in Pathway 2 may transition to the Calculus Pathway during the senior year with an appropriate bridge course.

⁶ Students in Pathway 3 may select Statistics or Mathematics Applications in the senior year in place of Calculus.



SCED Codes and Descriptions

Below are the SCED-aligned course descriptions that accompany Iowa's high school mathematics pathways. Page numbers refer to the [Iowa Academic Standards for Mathematics](#).

Algebra 1 — SCED 02052

Algebra 1 courses include the study of properties and operations of the real number system; evaluating rational algebraic expressions; solving and graphing first-degree equations and inequalities; translating word problems into equations; operations with and factoring of polynomials; solving quadratic equations; and modeling linear data. Specific content depends upon state standards. Model Algebra 1 course standards can be found in the Iowa Academic Standards for Mathematics, pages 112–122.

Geometry — SCED 02072

Geometry courses emphasizing an abstract, formal approach to the study of geometry, typically include topics such as properties of plane and solid figures; deductive methods of reasoning and use of logic; geometry as an axiomatic system including the study of postulates, theorems, and formal proofs; concepts of congruence, similarity, parallelism, perpendicularity, and proportion; and rules of angle measurement in triangles, quadrilaterals, vertical angles, lines intersected by a transversal, etc. Model Geometry course standards can be found in the Iowa Academic Standards for Mathematics, pages 123–132.

Algebra 2 — SCED 02056

Algebra 2 course topics typically include developing an understanding of the relationships between the symbolic, graphic, tabular and verbal representations of functions; utilizing the various representations to interpret function behavior and solve equations; operations with rational and irrational expressions; factoring of rational expressions; in-depth study of linear equations and inequalities; quadratic equations; solving systems of linear and quadratic equations; graphing of constant, linear, and quadratic equations; properties of higher-degree equations; exponential functions; inverse functions; statistical modeling; modeling linear and quadratic data; and operations with rational and irrational exponents. Model Algebra 2 course standards can be found in the Iowa Academic Standards for Mathematics, pages 133–146.

Algebra 2 (+) — SCED 02106

Advanced trigonometry and algebra topics (Algebra 2 +) courses combine trigonometry and advanced algebra topics, and are usually intended for students who have attained Algebra 1 and Geometry objectives. Topics typically include trigonometric and circular functions, inverses, and graphs; trigonometric identities and equations; solutions of right and oblique triangles; complex numbers; numerical tables; field properties and theorems; set theory; operations with rational and irrational expressions; factoring of rational expressions; in-depth study of linear equations and inequalities; quadratic equations; solving systems of linear and quadratic equations; graphing of constant, linear, and quadratic equations; modeling linear, quadratic, exponential, and trigonometric data; and properties of higher-degree equations. Algebra 2 course standards can be found in the Iowa Academic Standards for Mathematics, pages 133–146. Standards for advanced trigonometry and algebra topics are determined at the local district level.