Khan Academy Districts

Tasks build on student automaticity

Khan Academy's Algebra 1 TEKS-aligned course intentionally builds on students' prerequisite knowledge and automaticity, ensuring that new learning is supported by fluency with foundational skills. Tasks across the course activate prior knowledge, connect new concepts to previously mastered content, and scaffold students from recall-level skills to deeper conceptual and procedural mastery. This design aligns with TEKS expectations that students leverage automaticity with earlier mathematical ideas such as integer operations, proportional reasoning, and equation-solving to approach more sophisticated algebraic tasks.

Automaticity with Prerequisite Algebraic and Numerical Skills

Khan Academy Algebra 1 TEKS lessons frequently require students to apply previously learned skills automatically so they can focus on new, cognitively demanding tasks. Across the course, students:

- Use automaticity with integer and rational number operations to focus on solving equations, simplifying expressions, and manipulating functions.
- Apply previously mastered proportional reasoning to interpret slope, rate of change, and linear models.
- Use automatic fluency with linear equations and distributive property to support factoring, graphing, and completing the square.
- Rely on familiarity with tables and coordinate grids from middle school to interpret and construct function representations.
- Apply automatic knowledge of exponent rules (from grade 8 TEKS) when studying exponential functions and growth/decay models.
- Use fluency with two-step and multistep equation solving to solve more complex algebraic structures, including quadratics and systems.

These tasks align with prerequisite TEKS from Grades 6–8, such as:

- 8.3(C): use exponent laws
- 8.5(C): solve multi-step linear equations
- 7.4(C): represent proportional relationships
- 6.6(C), 7.6(C): operate with rational numbers
- 8.4(B): determine rate of change from tables and graphs

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Scaffolds That Connect Foundational Skills to New Concepts

Khan Academy builds on automaticity through lessons structured to smoothly transition from familiar content to more complex Algebra 1 ideas. Students:

- Begin function units by revisiting prior knowledge of input-output tables before moving to symbolic and graphical representations.
- Build on their understanding of linear relationships to explore exponential growth, then quadratic curvature.
- Use familiarity with solving linear equations to approach quadratic solutions through factoring, graphing, and the quadratic formula.
- Activate prior knowledge of area and factors when learning to factor quadratics into binomials.
- Rely on automatic understanding of coordinate geometry to analyze function transformations and symmetry.

Tasks That Build Fluency Through Practice Embedded in Context

Khan Academy strengthens automaticity through practice tasks that reinforce prerequisite skills while advancing new learning. Students:

- Complete mixed-practice problem sets that integrate prior-grade skills with Algebra 1 topics.
- Engage in warm-up problems designed to activate key skills needed for upcoming lessons.
- Use guided examples that reinforce procedural fluency while connecting to real-world scenarios.
- Build fluency through immediate feedback, allowing students to self-correct foundational misunderstandings before applying new concepts.

Examples include:

- Practice simplifying expressions prior to solving quadratics (TEKS A.11).
- Practice interpreting slope before modeling linear functions (TEKS A.3).
- Practice exponent rules before introducing exponential models (TEKS A.9).