Diagnostic Guide

Algebra 1

What this document covers

Section 1 Diagnostic Assessment Interface.

Section 2 Guide to Diagnostic Skill Entry Points (Tables 1–3).

Overview and Purpose

The Beginning-of-Year (BOY) Screener is a targeted diagnostic assessment consisting of 20 questions designed to evaluate student mastery of prerequisite standards from the prior grade level. For Grade Algebra 1, the screener specifically assesses Grade 8 TEKS to determine each student's readiness for on-grade-level instruction.

This diagnostic tool serves three primary functions:

1. **Snapshot of Readiness:** Measures student mastery of the previous grade's standards to establish a baseline for instruction.
2. **Actionable Insights:** Highlights specific strengths and areas of growth for both whole-class planning and individual student intervention.
3. **Automated Recommendations:** Assessment data automatically generates initial Practice Mode recommendations, assigning the specific skill entry points and interventions detailed in this guide.

How to Use This Guide

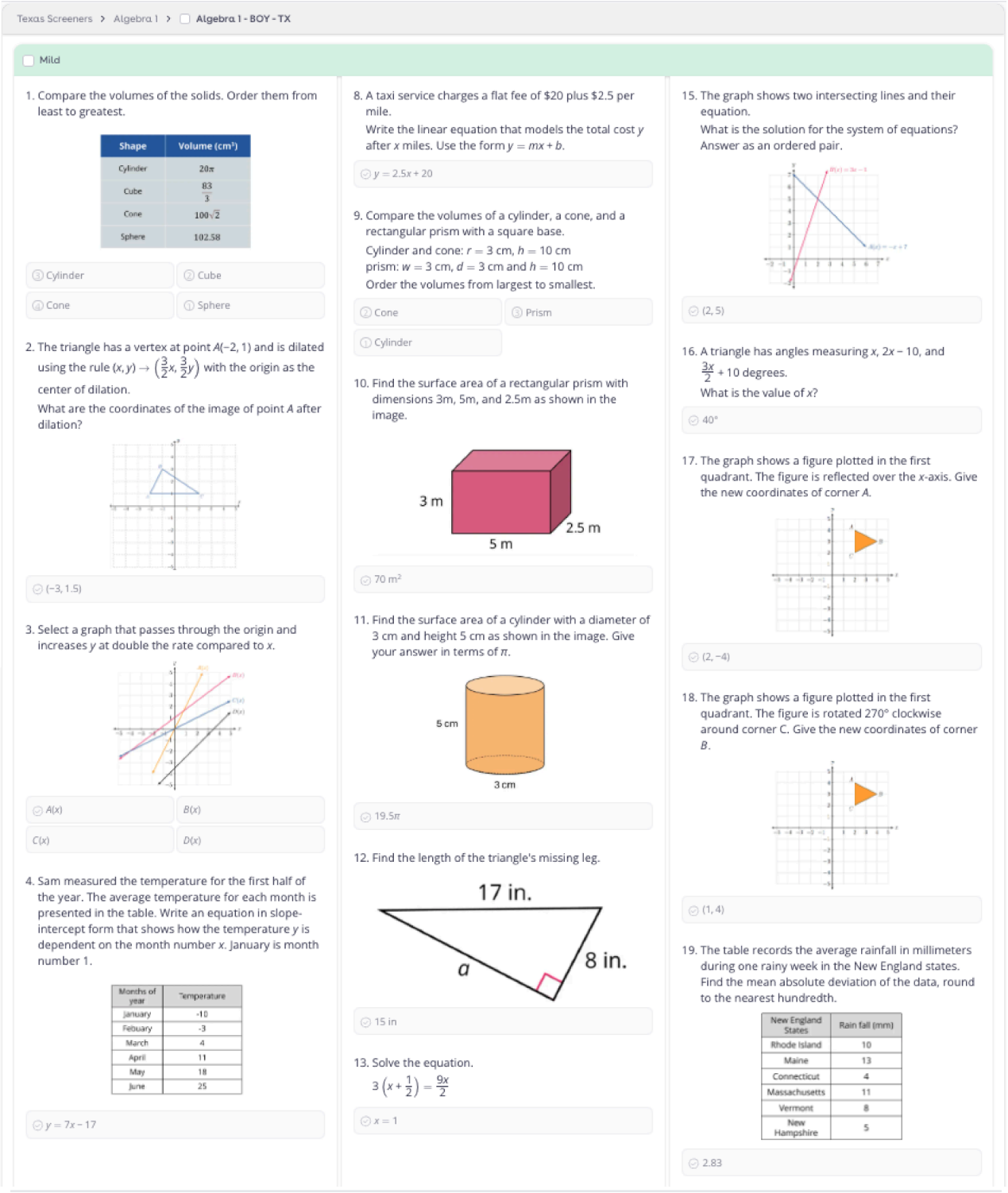
Based on the actionable insights generated by the screener, educators should use the following tables to identify and assign the appropriate skill entry points and interventions:

- **For Targeted Practice (Table 1):** Assign these Practice Cards for students who need a focused refresher on specific discrete skills (e.g., below 70% proficiency on individual questions). These can be used for independent work, station activities, or homework.
- **For Comprehensive Reteaching (Table 2):** Use these Grade 8 instructional chapters and sections for students demonstrating significant gaps across an entire domain (e.g., below 50% proficiency). These resources provide the conceptual foundation and guided instruction necessary to rebuild understanding before attempting Grade Algebra 1 content.
- **For Vertical Alignment (Table 3):** Refer to this matrix to see how each prerequisite skill connects to upcoming Grade Algebra 1 TEKS and chapters. Use this to prioritize interventions that are most critical for the specific Grade Algebra 1 content currently being taught.

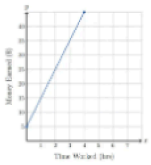
Section 1: Diagnostic Assessment Interface

The figure below demonstrates the teacher's view of the Grade Algebra 1 BOY Screener. This digital interface captures the student response data necessary to generate the recommended skill entry points and interventions detailed in Tables 1, 2, and 3.

Figure 1. *Grade Algebra 1 Beginning-of-Year Diagnostic Screener — Teacher View*

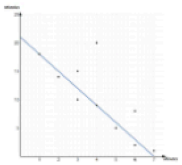


5. Cameron is calculating how much money he will make from walking dogs. He draws up the graph as shown. Write the equation of the line on point-slope form.



$y - 15 = 10(x - 1)$

6. The scatter plot shows the relationship between the number of mistakes students made on their test and the number of minutes they spent reviewing. If another student spent 6 minutes reviewing, how many mistakes would you predict they made?



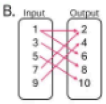
$y = 3$

7. Which alternative represents a function?

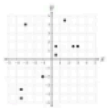
A.

x	y
1	5
2	6
3	7

B.



C.



D. {(1, 2)(2, 3)(2, 4)(3, 5)}

A

B

C

D

14. A rectangle has length $(2x + 1)$ cm and width $(x - 1)$ cm. Its perimeter is $3x + 13$ cm.

Write an equation and solve it to find the value of x.

$x = \frac{13}{3}$

20. Connor and Sammy are investigating the difference in their savings accounts. Connor saves with simple interest while Sammy saves with compound interest. They invest $1,000 at an annual interest rate of 5% for 3 years.

After 3 years, how much more money will Sammy have earned because of compound interest?

$7.63

Section 2: Guide to Diagnostic Skill Entry Points

Table 1: Diagnostic Intervention Guide — Recommended Practice Cards

This table maps each diagnostic question to targeted Practice Cards within the curriculum. These resources are designed for immediate, focused intervention—allowing students to practice the specific discrete skills identified as gaps (e.g., below 70% proficiency) without pausing the entire class for a full reteach. Teachers can assign these cards as independent work, station activities, or homework to efficiently close skill gaps.

Diagnostic Strand	Question(s)	Prerequisite TEKS (Grade 8)	Recommended Practice Cards
Number System and Place Value	Q1	8.2.D	· Order rational numbers
Operations	Q20	8.12.D	· Solve money word problems with all operations
Algebraic Reasoning	Q3	8.4.B	· Graph proportional relationships
	Q4, Q5	8.4.C	· Determine the rate of change (slope) of a linear function
	Q7	8.5.G	· Represent functions using graphs
	Q8	8.5.I	· Write line equations in slope-intercept form
	Q13, Q14	8.8.C	· Solve linear equations with variables on both sides
	Q16	8.9.A	· Solving systems of two linear equations graphically
Geometry and Measurement	Q2	8.3.C	· Dilate 2D figures on the coordinate plane
	Q9	8.7.A	· Calculate cylinder volume
	Q10, Q11	8.7.B	· Find surface area of right rectangular prism · Calculate surface area of cylinders
	Q12	8.7.C	· Find right triangle sides with Pythagorean theorem
	Q15	8.8.D	· Apply triangle angle sum theorem
	Q17, Q18	8.10.C	· Reflect 2D figures on the coordinate plane · Rotate 2D figures on the coordinate plane
Data Analysis	Q6	8.5.D	· Solve problems using functions fitted to data
	Q19	8.11.B	· Calculate and apply mean absolute deviation

Table 2: Prerequisite Reteach Guide — Grade 8 Instructional Alignment

For students demonstrating significant gaps (e.g., below 50% proficiency) across an entire domain, targeted practice alone may not be sufficient. This table directs educators to the full Grade 8 instructional chapters and sections required for deep reteaching. These resources provide the conceptual foundation and guided instruction necessary to rebuild prerequisite understanding before students attempt Grade Algebra 1 content.

Diagnostic Strand	Question(s)	Prerequisite TEKS (Grade 8)	Recommended Chapter	Recommended Sections
Number System and Place Value	Q1	8.2.D	**Real Numbers**	• Order a set of real numbers
Operations	Q20	8.12.D	**Personal Financial Literacy**	• Calculating investment earnings • Compound interest • Simple interest
Algebraic Reasoning	Q3	8.4.B	**Graphing Linear Relationships**	• Graphs of proportional relationships • Graphs of proportional relationships
	Q4, Q5	8.4.C	**Graphing Linear Relationships**	• Writing linear equations in point-slope form • Writing linear equations in slope-intercept form
	Q7	8.5.G	**Constructing Linear Relationships**	• Understanding functions
	Q8	8.5.I	**Constructing Linear Relationships**	• Constructing linear functions
	Q13, Q14	8.8.C	**One-Variable Equations**	• Solve linear equations with variables on both sides
	Q16	8.9.A	**Simultaneous Linear Equations**	• Verifying and finding solutions to simultaneous linear equations
Geometry and Measurement	Q2	8.3.C	**Transformation on the Coordinate Plane**	• Dilations
	Q9	8.7.A	**Volume, Surface Area, and Pythagorean Theorem**	• Volume of cones • Volume of cylinders • Volume of spheres
	Q10, Q11	8.7.B	**Volume, Surface Area, and Pythagorean Theorem**	• Surface area of cylinders • Surface area of rectangular prisms • Surface area of triangular prisms

Diagnostic Strand	Question(s)	Prerequisite TEKS (Grade 8)	Recommended Chapter	Recommended Sections
	Q12	8.7.C	**Volume, Surface Area, and Pythagorean Theorem**	• Pythagorean theorem • Use Pythagorean theorem to find a right triangle
	Q15	8.8.D	**One-Variable Equations**	• Angle sum and exterior angles • Parallel lines and transversals
	Q17, Q18	8.10.C	**Transformation on the Coordinate Plane**	• Reflections • Rotations • Translations
Data Analysis	Q6	8.5.D	**Constructing Linear Relationships**	• Linear associations • Scatter plots
	Q19	8.11.B	**Statistics**	• Mean absolute deviation

Table 3: Vertical Alignment Matrix — Connecting Prerequisites to Grade Algebra 1 Content

This matrix illustrates the instructional bridge between the Grade 8 prerequisite skills assessed in the diagnostic and the upcoming Grade Algebra 1 Target TEKS. It provides the rationale for intervention by showing exactly which Grade Algebra 1 chapters and units rely on these prerequisites. Educators should use this table to prioritize interventions that are most critical for the specific Grade Algebra 1 content currently being taught.

Diagnostic Strand	Question(s)	Prerequisite TEKS (Grade 8)	Aligned Target TEKS (Grade Algebra 1)	Chapters Addressed
Number System and Place Value	Q1	8.2.D	**A.11**	• Laws of Exponents • Radical Expressions
Operations	Q20	8.12.D	**A.9**	• Solving Linear Equations and Inequalities in One Variable • Systems of Linear Equations and Inequalities
Algebraic Reasoning	Q3	8.4.B	**A.3**	• Linear Functions and Two-Variable Equations • Linear Inequalities • Systems of Linear Equations and Inequalities
	Q4, Q5	8.4.C	**A.3**	• Linear Functions and Two-Variable Equations • Linear Inequalities • Systems of Linear Equations and Inequalities
	Q7	8.5.G	**A.12**	• Functions
	Q8	8.5.I	**A.2**	• Linear Functions and Two-Variable Equations
	Q13, Q14	8.8.C	**A.5**	• Solving Linear Equations and Inequalities in One Variable • Systems of Linear Equations and Inequalities
	Q16	8.9.A	**A.5**	• Solving Linear Equations and Inequalities in One Variable • Systems of Linear Equations and Inequalities
Geometry and Measurement	Q2	8.3.C	**A.3**	• Linear Functions and Two-Variable Equations • Linear Inequalities

Diagnostic Strand	Question(s)	Prerequisite TEKS (Grade 8)	Aligned Target TEKS (Grade Algebra 1)	Chapters Addressed
				• Systems of Linear Equations and Inequalities
	Q9	8.7.A	**A.12**	• Functions
	Q10, Q11	8.7.B	**A.12**	• Functions
	Q12	8.7.C	**A.11**	• Laws of Exponents • Radical Expressions
	Q15	8.8.D	**A.12**	• Functions
	Q17, Q18	8.10.C	**A.3**	• Linear Functions and Two-Variable Equations • Linear Inequalities • Systems of Linear Equations and Inequalities
Data Analysis	Q6	8.5.D	**A.4**	• Formulating Statistical Relationships
	Q19	8.11.B	**A.4**	• Formulating Statistical Relationships