Revised for the Most Recent TEKS

STAAR® MASTER®
Student Practice Book

Sample Booklet
Algebra I/EOC

Lori Mammen
Editorial Director

A Research-Based Series for Texas

For more than two decades, we have helped you achieve student success on Texas tests by providing the highest quality test-prep materials. With STAAR MASTER®, we continue our commitment to create research-based content that engages students and makes teaching easier.
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Sample page from STAAR MASTER® Student Practice Book Teacher Guide for Algebra I

The STAAR MASTER® Student Practice Book for Algebra I has 176 pages. The pages in this sample book represent only a portion of the entire workbook. Consumable workbooks—May not be reproduced. Free Teacher Guide included.
Inside the Teacher Guide
This teacher guide includes the following information—

- An overview of the STAAR MASTER® Student Practice Book and some key characteristics of the State of Texas Assessments of Academic Readiness (STAAR®) for Mathematics
- Descriptions of complexity levels assigned to practice items
- Strategies/suggestions for mathematics instruction and test preparation
- A mathematics vocabulary list for the appropriate grade level
- A master list of STAAR-eligible standards and expectations from the Texas Essential Knowledge and Skills (TEKS) for Algebra I (adopted 2014), including mathematical process skills
- A complete answer key, with corresponding complexity levels for each practice item

Inside the Student Practice Book
The STAAR MASTER Student Practice Book provides practice and review material for the Algebra I portion of the STAAR. The content reflects key components and characteristics of the yearly state assessment, including the following.

- The practice items focus on the grade-specific content of the STAAR-eligible TEKS for Algebra I adopted in 2014, including mathematical process skills.
- The practice items reflect the kinds of problems students might encounter on the actual STAAR.
- Whenever possible, practice items reflect a “real-world” context, connecting a broad range of topics and ideas of interest to students.
- Each exercise is labeled for easy identification of the TEKS reporting category, standard, and expectation addressed in the practice items.
- Several exercises address the same standard/expectation, providing repeated practice for students in a variety of contexts.
- Selected practice items are “griddable questions,” reflecting the format used on the actual STAAR.

Items in each student practice book address the standards and student expectations found within the reporting categories for the grade level.

- Reporting Category 1: Number and Algebraic Methods
- Reporting Category 2: Describing and Graphing Linear Functions, Equations, and Inequalities
- Reporting Category 3: Writing and Solving Linear Functions, Equations, and Inequalities
- Reporting Category 4: Quadratic Functions and Equations
- Reporting Category 5: Exponential Functions and Equations

The majority of items in the book also address the “Mathematical Process Standards” in the TEKS. Mastery of these standards and expectations is not reported under a separate category, but is incorporated into items throughout the five reporting categories.

Skills Tags: Each exercise includes a “skills tag” (see Figure 1) for easy identification of the TEKS-based standard and student expectation addressed in the exercise.

Readiness vs. Supporting Standards: The standards found in the STAAR-eligible TEKS are categorized as “readiness standards” or “supporting standards,” with greater emphasis on the former. Readiness standards address broader, deeper ideas and are considered more critical for students to know and master. Supporting standards address more narrowly defined ideas. While supporting standards are assessed, they receive less emphasis. The STAAR MASTER Student Practice Book mirrors this balance of readiness and supporting standards to provide meaningful, authentic practice for students.

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Teacher Guide for Algebra I

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Griddable Questions: In addition to multiple-choice items, the STAAR® for Algebra I also includes open-ended questions known as “griddable questions” (Texas Education Agency, 2014c). These open-ended items allow students to solve a problem without the influence of given answer choices. The answer grid for Algebra I has eight columns, a floating decimal point, and one column designated for a positive or negative sign (see Figure 2). All correct answers will be positive or negative numbers that range from -9,999,999 to 9,999,999. To indicate their answer, students enter the appropriate number(s) in the boxes and then fill in the corresponding “bubble(s)” below the number(s). Students will not grid units of measure (e.g., ft). It is acceptable for students to grid a zero as long as it does not affect the value of the correct answer. Students must enter a negative sign for a negative number. If the student does not mark a sign, the answer is assumed to be positive.

Mathematical Process Standards: The Mathematical Process Standards are not tested in isolation, nor do they appear in a separate reporting category. Rather, these standards are incorporated into items based on content standards from the five reporting categories and are reported along with those content standards. Similarly, items in the student practice book require students to demonstrate understanding of these important mathematical processes within the context of each problem. When a practice item requires the application of a process skill, a tag identifies the process standard and expectation addressed (see Figure 3).

Increased Rigor: Many educators describe the STAAR® as “more rigorous” than previous state assessments, but what does rigor mean? Academic rigor is a measure of the cognitive demand required by a specific test item. In a rigorous system, standards, curriculum, instruction, and assessment tightly align with congruent measures of cognitive complexity. In an integrated system, students must demonstrate a deep mastery of skills and understanding through rich, complex tasks. Students will definitely encounter problems that require higher levels of thinking than required on previous assessments. The student practice book includes items written at varying levels of complexity to reflect the kind of rigor students can expect on the actual test. Teachers should refer to “Depth of Knowledge” below for more information about the levels of complexity in practice items.

Depth of Knowledge: Norman Webb’s “depth-of-knowledge” model (2002a) is currently an influential alignment model in education. “Depth of knowledge” describes the degree of complexity required to solve a particular problem. Distinct cognitive demands occur at each level. Webb defines four levels of depth of knowledge: Level 1: Recall; Level 2: Skill or Concept; Level 3: Strategic Thinking; and Level 4: Extended Thinking.

Using a modified version of Webb’s depth-of-knowledge model (see page 5 of this teacher guide), we have aligned items in the STAAR® Student Practice Book to the TEKS. The complexity levels assigned to the items appear in the Answer Key.

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Descriptions of STAAR MASTER® Complexity Levels

The following descriptions provide an overview of the three complexity levels used to align the STAAR MASTER® Student Practice Book items to the STAAR®-eligible TEKS. Each explanation details the kinds of activities that occur within each level. However, they do not represent all of the possible thought processes for each level.

Low Complexity (L)
Low-complexity items align with the TEKS at Level 1 of the Webb (2002a) model. Items of low complexity involve recall and reproduction. Activities and problems at this level require routine, single-step methods. An item may ask students to recognize or restate a fact, definition, or term. For example, students may need to identify attributes of a geometric figure. Items of this complexity may require students to follow a basic procedure with clearly defined steps. At this cognitive level, students may need to apply a formula or perform a simple algorithm. Some major concepts represented at this level include arithmetic facts, perimeter, and converting units of measure. A low-complexity item may ask students to identify, recognize, use, or measure information and concepts.

Moderate Complexity (M)
Moderate-complexity items align with the TEKS at Level 2 of the Webb model. Items of moderate complexity involve both comprehension and the subsequent processing of information. Activities at this level demand more than one step in the reasoning process. Students are asked to determine how to best solve the problem. An item may ask students to generate a table of paired numbers based on a word situation. Items may involve using a model to solve a problem. At this cognitive level, students will need to visualize for tasks such as extending patterns and determining nonexamples. Items may involve interpreting information from a simple graph, table, or diagram. At this cognitive level, students will need to justify the reasonableness of a solution process when more than one solution exists. Students will use concepts to solve and explain problems, such as how changes in dimensions affect the volume of a figure. A high-complexity item may ask students to plan, reason, explain, compare, differentiate, draw conclusions, cite evidence, analyze, synthesize, apply, or prove. Some items also require students to apply low- and/or moderate-complexity skills and concepts.

High Complexity (H)
High-complexity items align with the TEKS at Level 3 and/or Level 4 of the Webb model. Items of high complexity require students to use strategic, multi-step thinking; develop a deeper understanding of the information and extend thinking. The problems at this level are non-routine and more abstract. Students are asked to demonstrate more flexible thinking, apply prior knowledge, make and test conjectures, and support their responses. High-complexity items may require students to make generalizations from patterns. Items may involve interpreting information from a complex graph, table, or diagram. At this cognitive level, students will need to justify the reasonableness of a solution process when more than one solution exists. Students will use concepts to solve and explain problems, such as how changes in dimensions affect the volume of a figure. A high-complexity item may ask students to plan, reason, explain, compare, differentiate, draw conclusions, cite evidence, analyze, synthesize, apply, or prove. Some items also require students to apply low- and/or moderate-complexity skills and concepts.

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# Mathematics Vocabulary

To perform their best on any mathematics assessment, students must understand the vocabulary of mathematics. The following list includes many of the mathematics words that students will encounter on the STAAR® assessment. This list includes words necessary for math conversation. Teachers should use their judgment in requiring students to master developmentally appropriate language.

**Note:** When a vocabulary term is addressed in multiple reporting categories, it is grouped with the reporting category in which it is either emphasized or introduced in the eligible TEKS.

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<tr>
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<th>Reporting Category 3: Writing and Solving Linear Functions, Equations, and Inequalities</th>
<th>Reporting Category 4: Quadratic Functions and Equations</th>
<th>Reporting Category 5: Exponential Functions and Equations</th>
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<td>asymptote</td>
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<td>plus or minus [±]</td>
<td>vertex</td>
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<tr>
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Teacher Guide for Algebra I

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STAAR MASTER® Mathematics References

*All Web sites listed were active at time of publication.


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Describing and Graphing Linear Functions, Equations, and Inequalities  

Exercise 3

A.3A: Determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$ (Supporting Standard)

(A.1B; A.1E; A.1F)

1. Look at the graph below.

What is the slope of the line?

A  $-2$
B  $-\frac{1}{2}$
C  $\frac{1}{2}$
D  2

(A.1B; A.1F)

2. What is the slope of the linear equation $y = 4 - 3x$?

A  $-3$
B  $-\frac{2}{3}$
C  $\frac{2}{3}$
D  2

(A.1B; A.1C; A.1F)

3. What is the slope of the equation $2x - 3y = 5$?

A  $-3$
B  $-\frac{2}{3}$
C  $\frac{2}{3}$
D  2

(A.1B; A.1E; A.1F)

4. Look at the graph below.

What is the slope of the line?

A  $-2$
B  $-\frac{1}{2}$
C  $\frac{1}{2}$
D  2
Reporting Category 3  
Writing and Solving Linear Functions, Equations, and Inequalities  

Exercise 3

1. Look at the graph below.

What is the domain and range for the graph?

<table>
<thead>
<tr>
<th></th>
<th>Domain</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$-1 \leq x \leq 4$</td>
<td>$y = -2$</td>
</tr>
<tr>
<td>B</td>
<td>$-1 \leq x \leq 4$</td>
<td>$y = -1$</td>
</tr>
<tr>
<td>C</td>
<td>$-1 \leq x &lt; 4$</td>
<td>$y = -2$</td>
</tr>
<tr>
<td>D</td>
<td>$-1 \leq x &lt; 4$</td>
<td>$y = -1$</td>
</tr>
</tbody>
</table>

2. Jordan is ordering DVDs online. She will order no less than 9 and no more than 13 DVDs. Each DVD costs $14.99. Which of the following is NOT a reasonable total Jordan will spend on the DVDs, excluding tax and shipping?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>$134.91$</td>
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<tr>
<td>B</td>
<td>$165.89$</td>
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<tr>
<td>C</td>
<td>$179.88$</td>
</tr>
<tr>
<td>D</td>
<td>$194.87$</td>
</tr>
</tbody>
</table>

3. Samantha is making curtains for 3 windows. Each window needs 18 to 20 square feet of fabric. Fabric costs $2.50 per square foot, including tax, and can only be purchased in whole square foot quantities. Which of the following represents all of the possible total costs, $c$, Sarah could incur to make curtains for all 3 windows? (Assume all costs are represented in dollars.)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$45 \leq c \leq 50$</td>
</tr>
<tr>
<td>B</td>
<td>$135 \leq c \leq 150$</td>
</tr>
<tr>
<td>C</td>
<td>${45, 47.50, 50}$</td>
</tr>
<tr>
<td>D</td>
<td>${135, 137.50, 140, 142.50, 145, 147.50, 150}$</td>
</tr>
</tbody>
</table>
Reporting Category 3  
Writing and Solving Linear Functions, Equations, and Inequalities  

Exercise 34

A.5B: Solve linear inequalities in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides (Supporting Standard)

(A.1B; A.1F)

1. Look at the inequality below.

\[ 2(3x - 4) - 1 < 3(4x + 1) \]

The inequality can be simplified to—

A. \( x < -2 \)

B. \( x > -2 \)

C. \( x < \frac{4}{3} \)

D. \( x > -\frac{4}{3} \)


(A.1A; A.1B; A.1D; A.1F)

2. For the first 40 hours of work each week, Mr. Ericson earns $600. For each hour over 40 hours, Mr. Ericson earns $22.50 an hour. The company can pay each employee up to $960 per week. Without going over the weekly budget, Mr. Ericson can work up to—

A. 16 hours

B. 40 hours

C. 56 hours

D. 60 hours


(A.1B; A.1E; A.1F)

3. Which number line represents the solution set for the inequality below?

\[ x + 4 < 2 - 4(x - 3) \]


(A.1A; A.1B; A.1D; A.1F)

4. A gym charges adults a flat fee of $25 and $3 per visit. The gym charges students a flat fee of $49 for unlimited visits. The student plan is less expensive than the adult plan if a person visits the gym—

A. 8 times

B. 8 or more times

C. less than 8 times

D. more than 8 times
Use the following information to answer questions 1 and 2.

The height of an object thrown into the air is given by the function \( h(t) = -16t^2 + 24t \), where \( t \) is the time in seconds and \( h(t) \) is the height in feet. The graph of \( h(t) \) is shown below.

1. At what time does the object reach its maximum height?
   - A 0 seconds
   - B 0.75 seconds
   - C 1.5 seconds
   - D 5 seconds

2. How long does it take for the object to hit the ground after it is thrown into the air?
   - A 0.75 seconds
   - B 1 second
   - C 1.5 seconds
   - D 5 seconds

3. A quadratic function is graphed below.

   Based on the graph, which of the following are true?
   I. The graph has a negative y-intercept.
   II. The graph has two positive zeros.
   III. The graph has a minimum in Quadrant IV.
   IV. The graph has an axis of symmetry of \( x = 0 \).
   - A I and II
   - B I and III
   - C I, II, and III
   - D I, III, and IV
1. At an archery competition, David shot an arrow from 4 feet high and hit the target on the ground exactly 20 feet away, as shown below.

The typical path of the arrow is represented by the quadratic function \( f(x) = -0.05x^2 + 0.8x + 4 \). What is the best prediction for the height of the arrow when it is 15 feet away from David?

A. 4 ft  
B. 4.25 ft  
C. 4.75 ft  
D. 5.4 ft

2. Look at the table below.

Using a graphing calculator or computer, which quadratic function provides the most reasonable fit for the data in the table?

A. \( f(x) = 0.13x^2 + 17.51x - 3.01 \)  
B. \( f(x) = 0.13x^2 - 3.01x + 17.51 \)  
C. \( f(x) = -3.01x^2 + 0.13x + 17.51 \)  
D. \( f(x) = -3.01x^2 + 17.51x + 0.13 \)
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