

# **STAAR** **MASTER**<sup>™</sup>

Student Practice Book

## **Sample Booklet**

Grade 3  
**Mathematics**



Lori Mammen  
Editorial Director

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Selected pages from  
**STAAR MASTER™**

**Student Practice Book  
Mathematics, Grade 3**

for the State of Texas Assessments  
of Academic Readiness

**Teacher Guide**



**Lori Mammen**  
Editorial Director

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## What’s Inside the Student Practice Book?

The *STAAR MASTER™ Student Practice Book* provides practice and review material for the Grade 3 Mathematics portion of the State of Texas Assessments of Academic Readiness (STAAR™).

- The practice items reflect the kinds of problems students might encounter on the actual STAAR assessment.
- The practice items cover a broad range of topics and ideas of interest to third-grade students.
- The practice items focus on the 2009–2010 STAAR-eligible Mathematics Texas Essential Knowledge and Skills (Texas Education Agency, 2010b) standards.
- Each exercise is labeled for easy identification of the TEKS-based 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 problems are “griddable items” (see Figure 2), which reflects the format used randomly throughout the actual STAAR assessment.

Items in the *STAAR MASTER Student Practice Book* address the following mathematical concepts:

- Numbers, operations, and quantitative reasoning
- Patterns, relationships, and algebraic reasoning
- Geometry and spatial reasoning
- Measurement
- Probability and statistics
- Underlying processes and mathematical tools (not a separate reporting category)

### Exercise Skills Tags

Each exercise is labeled with a “skills tag” (see Figure 1, below) for easy identification of the TEKS-based reporting category, standard, and expectation addressed in the problems.

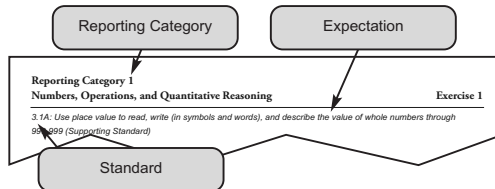


Figure 1: Exercise Skills Tag

### Griddable Items

In addition to multiple-choice items, STAAR Mathematics assessments will also use open-ended questions known as “griddable items” (Texas Education Agency, 2010d). This type of assessment question allows students to reach the answer without the influence of given answer choices. The third-grade STAAR Mathematics assessment will likely include three griddable items. The answer grid will have two columns and no decimal point (see Figure 2, below). Correct answers are positive numbers that range from 0 to 99. To indicate their answer, students must appropriately enter the number in the boxes and then fill in the corresponding bubbles. Students will not grid the units (e.g., ft). It is acceptable to grid a zero that does not affect the value of the correct answer.

The figure shows a math problem with a griddable answer area. The problem is: '3. Olivia's cafeteria served 421 students on Monday and 407 on Tuesday. How many more students were served on Monday?'. Below the problem, it says: 'Record your answer in the boxes. Then fill in the bubbles. Be sure to use the correct place value.' To the right of the text is a grid with two columns and ten rows. Each cell in the grid contains a circled digit from 0 to 9. The top row is for the tens place and the bottom row is for the ones place.

Figure 2: Griddable Item for Third-Grade Mathematics

### This Teacher Guide includes—

- an overview of the Student Practice Book and key characteristics of the STAAR program
- descriptions of *STAAR MASTER* complexity levels
- strategies for test preparation and mathematics instruction
- a master list of STAAR-eligible standards and expectations addressed in the Mathematics TEKS
- a complete answer key (with corresponding complexity levels for the practice items)

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**Readiness vs. Supporting Standards**

The eligible, or tested, TEKS are divided into “readiness standards” and “supporting standards,” with greater emphasis on the former. Readiness standards address broader, deeper ideas and are deemed more critical for students to know. Supporting standards address more narrowly defined ideas and will still be assessed, although not emphasized. The *STAAR MASTER™ Student Practice Book* mirrors this balance of readiness and supporting standards to provide meaningful, authentic student practice for the STAAR™ assessment.

**Underlying Processes and Mathematical Tools**

In the STAAR program, underlying processes and mathematical tools are not tested in isolation under a separate reporting category. These critical skills, which were once identified under TAKS Objective 6, are now incorporated into at least 75% of the practice items from eligible TEKS and are reported along with those content standards (Texas Education Agency, 2010c). Similarly, in the *STAAR MASTER Student Practice Book*, students are asked to demonstrate processes and tools used in problem solving within the context of practice items for other standards. When one of these skills is incorporated into a practice item, the standard and expectation are identified above the practice item (see Figure 3, below).

(3.16)

1. If the number pattern below continues, what will the next two numbers be?

3, 6, 9, \_\_, \_\_

A 10, 11  
 B 11, 13  
 C 12, 15  
 D 12, 16

(3.16) Underlying processes and mathematical tools. The student uses logical reasoning.

**Figure 3: Practice Item Testing Underlying Processes and Mathematical Tools**

**Increased Rigor**

The STAAR program is described as “significantly more rigorous” (Texas Education Agency, 2010a) than the Texas Assessment of Knowledge and Skills (TAKS). But what does *rigor* mean in assessment? For the STAAR program, it means the cognitive complexity of items will increase to assess skills at a greater depth. Also, the test will include more griddable items, allowing students to arrive at answers independently through open-ended response. The *STAAR MASTER Student Practice Book* provides items written at varying levels of complexity to accommodate this increase in

rigor. (Refer to the “Depth of Knowledge” section on this page and Box 1 on page 5 for more information about the levels of complexity in practice items.)

**Alignment**

According to the mandate of No Child Left Behind (2001), states are required to develop assessments that tightly align to their content standards. To ensure that this requirement is met, states and districts often conduct alignment studies. In such a study, an assessment is compared to the state’s content standards. If an assessment is rigorous, the study will not yield large disparities between the cognitive demands of the expectations and those of the assessment.

**Depth of Knowledge**

Norman Webb’s (2002) “depth of knowledge” model is currently one of the most influential alignment models in the field of education. “Depth of knowledge” describes the degree of complexity of knowledge a curricular item requires. Webb identifies four levels of depth of knowledge: recall (Level 1), skill or concept (Level 2), strategic thinking (Level 3), and extended thinking (Level 4). Distinct cognitive demands occur during each activity, or thinking process, level. The items in the *STAAR MASTER Student Practice Book* were aligned to the TEKS using a modified version of the “depth-of-knowledge” model (see Box 1, “Descriptions of *STAAR MASTER™* Complexity Levels,” page 5). During the alignment process, the complexity level of each item (designated “Low,” “Moderate,” or “High”) was determined. The level of each practice item can be found in the Answer Key.


### 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 eligible Mathematics 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 (2002) 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.

(3.15)  
2. Look at this teepee made for a class project.



Which shape does this teepee best represent?

A Cone  
B Square pyramid

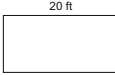
Low Complexity

#### 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 real-life 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. Some major concepts represented at this level include classifying geometric figures, determining probability, and using strategies to estimate. Items of this complexity may ask students to classify, organize, observe,

collect and display data, or compare data. Some items also require students to apply low-complexity skills and concepts.

(3.14, 3.15)  
3. The Lopez family is planning to put a rectangular pool in their backyard. The perimeter of the pool is 60 feet.



The width of the pool is—


A 10 ft      C 60 ft  
B 20 ft      D 30 ft

Moderate Complexity

#### 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.

(3.14, 3.15, 3.16)  
2. Elizabeth has the following stickers in her purse.



Which of the following is true if Elizabeth takes a sticker out of her purse without looking?

A Elizabeth is more likely to get a moon than a star.  
B Elizabeth is less likely to get a flower than a moon.  
C Elizabeth is more likely to get a flower than a moon.

High Complexity

\*Note: Although state standards may include expectations that require extended thinking, many large-scale assessment activities are not classified as Level 4. Performance and open-ended assessment may require activities at Level 4.

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Box 1: Descriptions of STAAR MASTER™ Complexity Levels

## How to Use This Book

### Effective Test Preparation

What is the most effective way to prepare students for any mathematics competency test? Experienced educators know that the best test preparation includes three critical components—

- a strong curriculum that is aligned with the content and skills to be assessed
- effective, relevant, and varied instructional methods that allow students to learn content and skills in many different ways
- targeted practice that familiarizes students with the specific content and format of the test

Obviously, a strong curriculum and effective, relevant, and varied instructional methods provide the foundation for all appropriate test preparation. Contrary to what some might believe, merely “teaching the test” performs a great disservice to students. Students must acquire knowledge, practice skills, and have specific educational experiences that can never be included on tests limited by time and in scope. For this reason, resources like the *STAAR MASTER™ Student Practice Book* should never become the heart of the curriculum or replace strong instructional methods.

### Targeted Practice

The *STAAR MASTER Student Practice Book* does, however, address the final element of effective test preparation (targeted test practice). This book familiarizes students with—

- the specific content of Texas’ competency test
- the general format of competency tests

When students become familiar with both the content and the format of a test, they know what to expect on the actual test. This, in turn, improves their chances for success.

### Using STAAR MASTER™ Products

Used as part of the regular curriculum, the *STAAR MASTER Student Practice Book* allows teachers to—

- pretest skills students need for the actual test
- determine students’ areas of strength and/or weakness
- provide meaningful test-taking practice for students
- ease students’ test anxiety
- communicate test expectations and content to parents

## Other Suggestions for Instruction

The *STAAR MASTER Student Practice Book* can serve as a springboard for other effective instructional strategies that help with test preparation.

### Group Work

Teachers and students can work through selected practice exercises together, noting the kinds of problems and range of problem-solving techniques. They should discuss common errors for each kind of question and strategies for avoiding these errors.

### Formulating Answers

Teachers may encourage students to use scratch work to formulate their own answers on paper rather than simply using mental math or guessing based on the given answer choices. After solving a problem on their own, students can read the given answer choices and determine which one, if any, matches the answer they have recorded. If they cannot find their solution among the given answer choices, they can refer to their scratch work and determine their error.

### Developing Test Problems

Teachers may create additional problems that cover skills in a different way than those provided in the exercises. Teachers and students can also select “test-type” problems from other assigned math exercises.

### Developing Fundamental Understanding

Teachers can promote the recognition of mathematics in everyday life by developing problems relevant to students’ daily experiences in the classroom and at home. Working through problems that relate directly to students’ experiences fosters understanding of underlying processes and mathematical tools.

## Answer Key

Note: Complexity levels appear in parentheses. L = Low, M = Moderate, H = High

### Reporting Category 1

#### Exercise 1

1. D (L)   2. B (L)   3. D (L)   4. A (L)  
5. C (L)

#### Exercise 2

1. B (L)   2. C (L)   3. B (L)   4. C (L)  
5. B (L)   6. D (L)

#### Exercise 3

1. D (L)   2. A (L)   3. D (L)   4. C (L)  
5. B (M)   6. C (L)

#### Exercise 4

1. C (M)   2. D (M)   3. C (M)   4. C (M)

#### Exercise 5

#### Exercise 18

1. B (M)   2. D (L)   3. C (L)   4. B (M)

#### Exercise 19

1. D (M)   2. D (M)   3. C (M)   4. A (M)

#### Exercise 20

1. C (M)   2. B (M)   3. B (M)

#### Exercise 21

1. A (M)   2. B (M)   3. B (M)   4. C (H)

#### Exercise 22

1. D (M)   2. B (M)   3. C (M)   4. A (M)  
5. C (M)

#### Exercise 23

1. C (M)   2. C (M)   3. D (M)

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**Lori Mammen**  
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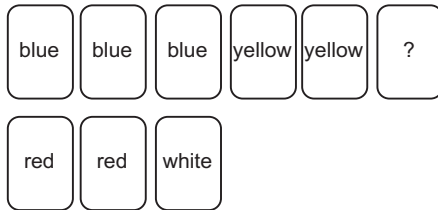
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**Reporting Category 1  
Numbers, Operations, and Quantitative Reasoning**

**Exercise 14**

3.2C: Use fraction names and symbols to describe fractional parts of whole objects or sets of objects  
(Readiness Standard)

1. In the set of cards shown below, there are four different colors.



$\frac{3}{9}$  are blue.  $\frac{2}{9}$  are yellow.

$\frac{3}{9}$  are red.  $\frac{1}{9}$  are white.

Based on this information, what color is missing?

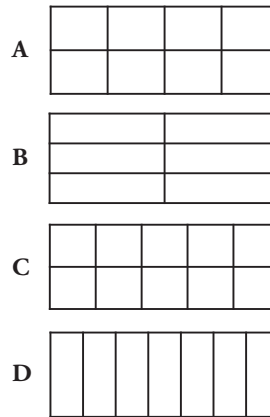
- A Blue
- B Red
- C White
- D Yellow

(3.14)

2. Jarrod has 3 quarters, 2 dimes, 4 pennies, and 1 nickel in his pocket. What fraction of his coins are dimes?

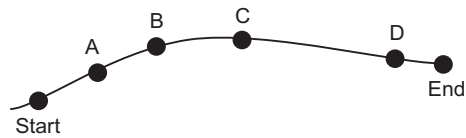
- A  $\frac{10}{2}$
- B  $\frac{2}{8}$
- C  $\frac{2}{10}$
- D  $\frac{2}{11}$

3. Which tray of brownies is cut so that 8 people can each have an equal share of the brownies?



(3.14; 3.15)

4. Rosa's family is hiking along a trail in the park, as shown below.



At which point will Rosa's family have hiked about  $\frac{1}{3}$  of the trail?

- A Point A
- B Point B
- C Point C
- D Point D

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**Reporting Category 2  
Patterns, Relationships, and Algebraic Reasoning**

**Exercise 17**

3.7A: Generate a table of paired numbers based on a real-life situation, such as insects and legs  
(Supporting Standard)

(3.14; 3.16)

- Hayden put the same amount of money in his bank account each month. The chart shows how many dollars he had saved after 3 months, 4 months, and 5 months.

<b>Number of Months</b>	3	4	5	6	7	8	9
<b>Dollars Saved</b>	21	28	35				

If Hayden keeps saving at the same rate, how many months will it take him to save \$49?

- A 6 months
- B 7 months
- C 8 months
- D 9 months

(3.14; 3.16)

- Marisa sold drinks at the baseball game. After 3 hours, she noticed that she had sold 18 drinks. The chart shows the number of drinks she sold after 3 hours, 4 hours, and 5 hours.

<b>Number of Hours</b>	3	4	5	6	7	8	9
<b>Number of Drinks Sold</b>	18	24	30				

If Marisa continued to sell drinks at the same rate, after how many hours had she sold 54 drinks?

- A 6 hours                      C 8 hours
- B 7 hours                      D 9 hours

(3.14; 3.16)

- James noticed that he used 12 line segments to draw 3 squares. The chart shows how many line segments he used to draw more squares.

<b>Number of Squares</b>	3	4	5	6	7	8	9
<b>Number of Segments</b>	12	16	20				

How many line segments would James use to draw 8 squares?

Record your answer in the boxes. Then fill in the bubbles. Be sure to use the correct place value.

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

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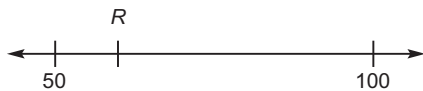
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**Reporting Category 3  
Geometry and Spatial Reasoning**

**Exercise 21**

3.10A: Locate and name points on a number line using whole numbers and fractions, including halves and fourths (Readiness Standard)

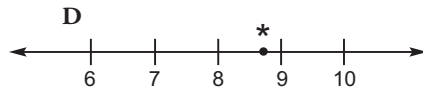
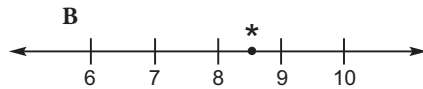
- (3.15)  
1. Look at the number line below.



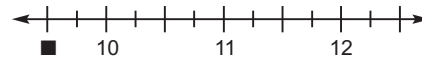
What number on the line does the letter *R* most likely represent?

- A 51
- B 60
- C 75
- D 80

- (3.15)  
2. Which number line has a star above  $8\frac{3}{4}$ ?



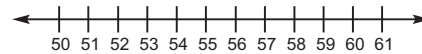
- (3.15)  
3. Look at the number line below.



What number belongs in place of the black box?

- A 9
- B  $9\frac{1}{4}$
- C  $9\frac{1}{2}$
- D  $9\frac{3}{4}$

- (3.14; 3.15)  
4. Jenna drew a number line like the one below.



If Jenna started on 57 and added 3, on what number did she land?

- A 54
- B 58
- C 60
- D 61

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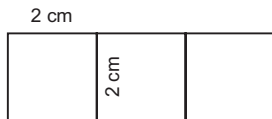
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**Reporting Category 4  
Measurement**

**Exercise 7**

3.11B: Use standard units to find the perimeter of a shape (Readiness Standard)

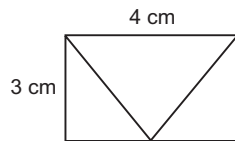
- (3.15)  
1. Look at the figure below.



What is the perimeter of this shape?

- A 4 centimeters
- B 8 centimeters
- C 12 centimeters
- D 16 centimeters

- (3.15)  
2. Look at the figure below.



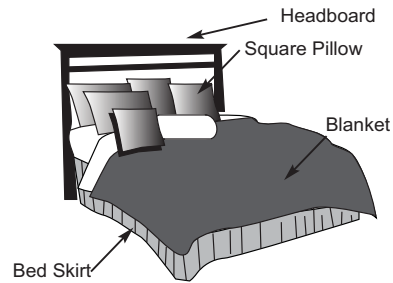
What is the perimeter of the rectangle?

- A 9 cm
- B 10 cm
- C 12 cm
- D 14 cm

- (3.15)  
3. The perimeter of a tabletop is 14 feet. If the table is 5 feet long, what is the table's width?

- A 1 foot
- B 2 feet
- C 4 feet
- D 9 feet

- (3.14; 3.15)  
4. Look at the bed below.



Which item could be used to determine the perimeter of the bed?

- A Bed skirt
- B Blanket
- C Headboard
- D Square pillow

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**Reporting Category 5  
Probability and Statistics**

**Exercise 9**

3.13A: Collect, organize, record, and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data (Readiness Standard)

(3.14; 3.15)

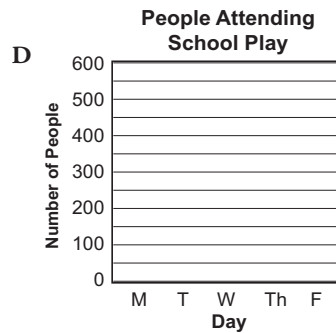
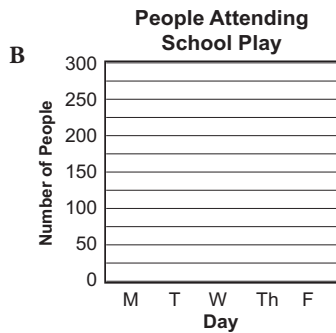
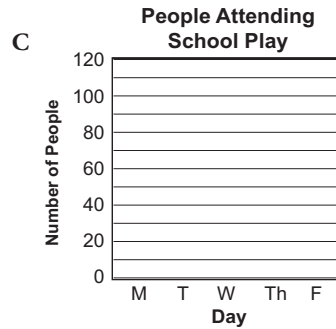
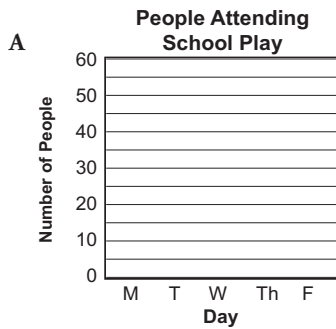
- Connie kept track of the number of people who came to the school play each day. The results are shown in the table below.

**People Attending School Play**

Day	Number of People
Monday	150
Tuesday	225
Wednesday	200
Thursday	175
Friday	250

Connie wants to put this information on a graph. Which of the following blank graphs would be the best one for Connie to use?

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