

# SpringBoard<sup>®</sup>

Transforming Teaching Practices and Student Learning

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## Mathematics at a Glance

### Grades 6–12



# Transform Teaching Practices and Student Learning

SpringBoard® is a strategically developed, comprehensive instructional program. Combining rigorous instruction, performance-based assessments, and immersive professional learning, SpringBoard prepares students for success in Advanced Placement® courses and in college-level work.

## Beginning with the end in mind.

Effective instructional tools, back mapped to assessments, help teachers adapt the program to specific students' needs.

### Unit Overview

provides the big picture of the unit for students.



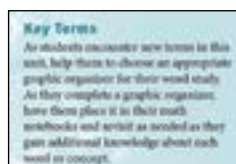
### Unpacking Embedded Assessments

identifies knowledge, skills, and vocabulary assessed on each Embedded Assessment.



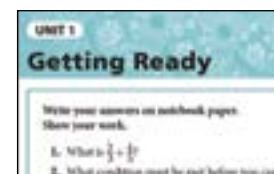
### Key Terms (Academic Vocabulary and Mathematic Terms)

separate academic and mathematic terms to support literacy in the mathematics classroom.



### Getting Ready

assesses students' prerequisite skills and connects to the focused Getting Ready Practice available on SpringBoard Digital.



### Essential Questions

guide rigorous instruction and student understanding using universal questions.



### AP® Connections

serve as explicit pathways to college readiness and advanced mathematics course work.



## A road map of every unit.

A variety of texts, tools, and activities in a clear learning sequence.

### Activities and Lessons

are scaffolded toward the Embedded Assessment.

### Embedded Assessments

provide guided instruction that is previewed by students and teachers to unpack knowledge, skills, and vocabulary covered in each unit.

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# Formative Assessment, Differentiation, and Practice

14. Is the equation  $y = \frac{1}{2}x + 3$  what is the constant of variation?

**LESSON 10-2 PRACTICE**

15. Graph each function. Identify whether the function is an indirect variation.

a.  $y = -\frac{1}{2}x + 3$

b.  $y = \frac{1}{2}x$

16. Write some problems for the following functions.

a.  $y = 2x + 3$  when  $x = 1$ . Find  $y$  when  $x = 2$ . Find the rate.

b.  $y = 2x + 3$  when  $x = 1$ . Find  $y$  when  $x = 2$ . Find the rate.

**ACTIVITY 9 PRACTICE**

Write your answers on notebook paper. Show your work.

**Lesson 9-1**

1. Find  $\Delta x$  and  $\Delta y$  for each of the following pairs of points.

a.  $(2, 4), (1, -4), (-4, -8)$

b.  $(5, 1), (1, -4)$

c.  $(-3, -3), (-2, 0), (0, 0)$

2. Find the slope.

a.  $y = \frac{1}{2}x + 3$

b.  $y = \frac{1}{2}x$

c.  $y = \frac{1}{2}x + 3$

d.  $y = \frac{1}{2}x$

e.  $y = \frac{1}{2}x + 3$

f.  $y = \frac{1}{2}x$

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## Lesson Practice, Activity Practice, and Additional Unit Practice

provide the opportunity for students to practice new learning and build fluency, with additional practice available in SpringBoard Digital Editions.

To help discover which factors of the cup affect the height of the stack, collect data on two types of cups found around the office.

1. Use appropriate tools strategically. Use two different types of cups to complete the tables below.

CUP 1		CUP 2	
Number of Cups	Height of Stack	Number of Cups	Height of Stack
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	

2. Express regularity in repeated reasoning. What patterns do you notice that might help you figure out the relationship between the height of the stack and the number of cups in that stack?

## Mathematical Practices

guide teaching and learning and are called out in bold print for easy identification.

**Check Your Understanding**

**Make use of structure.** Create an equation that will have each of the following as its solution.

- One solution
- No solution
- Infinitely many solutions
- A solution of zero

## Check Your Understanding

provides fast, formative assessments prior to lesson practice.

**SUGGESTED LEARNING STRATEGIES:** Levels of Questions, Think-Pair-Share, Interactive Word Wall, Construct an Argument, Quickwrite

## Strategies

suggest a variety of research-based approaches to meet learning targets.

**MATH TERMS**

The **graph of an inequality** one variable is all the points on a number line that make the inequality true.

**TEACHER TO TEACHER**

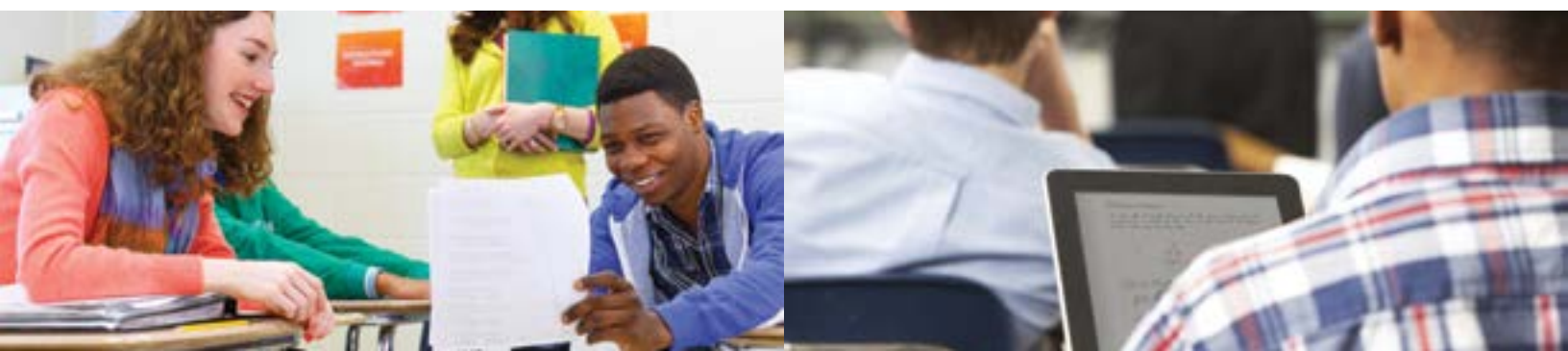
Be sure to point out that when students define a variable, they should state not only the quantity that the variable represents, but also the units used to measure the quantity. For example, if students use the variable  $h$  for a height, they need to state whether the height is measured in inches, meters, or some other unit.

**WRITING MATH**

Other phrases that are equivalent to "at least" are "no less than" and "no fewer than." These phrases are also represented by the inequality symbol  $\geq$ .

## Callouts for Differentiating Instruction, Reading Terms, Writing Math, and Teacher to Teacher

provide additional support for teachers and students at point of use.





# Work Worth Doing

SpringBoard activities are strategically scaffolded.

**ACTIVITY 3**  
Guided

**Activity Standards Focus**  
In Activity 3, students write and solve linear inequalities in one variable, including multi-step inequalities and inequalities with variables on both sides. They graph solutions of inequalities on number lines and explore how inequalities can represent constraints in real-world situations. They also solve and graph compound inequalities. Throughout this activity, emphasize the importance of paying attention to the inequality sign and the circumstances in which it should be reversed.

**Lesson 3-1**

**Activity Standards Focus** targets components of the standards addressed by each activity.

**Common Core State Standards for Embedded Assessment 2**

**HSA-CED.A.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions and simple rational and exponential functions.

**HSA-CED.A.3** Represent constraints by equations or inequalities and by systems of equations and/or inequalities and interpret solutions as viable or non-viable options in a modeling context.

**HSA-REI.B.3** Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

**College and Career Readiness Standards** are explicitly called out.

**Learning Targets:**

- Understand what is meant by a solution of an inequality.
- Graph solutions of inequalities on a number line.

**Learning Targets** show standards in student-friendly language.

**ACTIVITY 6**  
Directed

**Activity Standards Focus**  
In Activity 6 students determine domain and range of various relations and identify relative maxima and minima. Students extend their thinking to real-world situations by interpreting

**ACTIVITY 4**  
Guided

**Activity Standards Focus**  
In Activity 4, students use absolute equations and absolute value inequalities to solve problems. Students apply definition of absolute value to write absolute value equation as two separate

**ACTIVITY 1**  
Investigative

**Activity Standards Focus**  
In previous grades, students began to develop algebraic thinking skills by writing numeric and algebraic expressions to represent situations and by using tables and graphs to examine the relationship

**Balanced Approach:**

1. **Directed** activities build fluency and procedural understanding.
2. **Guided** activities support concepts requiring both direct instruction and investigative learning.
3. **Investigative** activities empower students to explore and discover mathematical concepts through a contextual setting.



# Assessment Drives Instruction

Each Instructional Unit is built around a performance-based Embedded Assessment.

## Assessment Focus

outlines objectives.

## Embedded Assessment 2

### Assessment Focus

- Writing, solving, and graphing inequalities

## Standards Alignments

target the rigorous, specific standards addressed in the unit's activities and assessments.

### Common Core State Standards for Embedded Assessment 2

- HSA-CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions and simple rational and exponential functions.
- HSA-CED.A.3 Represent constraints by equations or inequalities and by systems of equations and/or inequalities and interpret solutions as viable or non-viable options in a modeling context.
- HSA-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

## Scoring Guides

set clear expectations for student performance in both content and Standards for Mathematical Practice.

### Scoring Guide

Math Knowledge and Thinking  
(Items 1, 2a, 2b, 3a, 3b, 5)

### Exemplary

The solution demonstrates these characteristics:

- Clear and accurate understanding of how to solve and graph inequalities, including compound and absolute value inequalities

### Proficient

- Largely correct understanding of how to solve and graph inequalities, including compound and absolute value inequalities

### Emerging

- Partial understanding of how to solve and graph inequalities, including compound and absolute value inequalities

- Strategy that results in some incorrect answers

## Formative and Summative Assessments

include both short-cycle and end-of-unit formats to measure students' progress on Learning Targets.

**Your SpringBoard®**

Viewing Assessment Preview

Question Type

This table displays the hourly rental cost for a kayak.

Hours	0	2	4	6
Cost	\$0	\$12	\$24	\$36

Let  $x$  represent the number of hours the kayak is rented. Which expression models the rental cost after  $x$  hours?

A  $12 + 3x$

B  $12 + 3x + 12$

C  $3x + 12 + 12$

D  $3x + 12 + 12 + 12$

**Your SpringBoard®**

Viewing Assessment Preview

Algebra 1 Unit 1 Open-Response

Question One

Shelby is going to start with 100 and then, each time she gets a reward, she will take a constant number of items per point of positive and the first time possible in the next period. Students solve the equation  $100 + 5x = 425$  where  $x$  represents the number of points of positive for which she is allowed to purchase the first item.

Identify the meaning of each of the constants in the equation in the context of the problem. How does the equation determine how many points of positive for which she is allowed to purchase the first item?

# SpringBoard® Digital

Seamless integration for instructional continuity.

24/7 online access.

## Assessments

with multiple-choice, short answer, and technology-enhanced items can be printed or delivered online.

## Planning and Organizational Tools

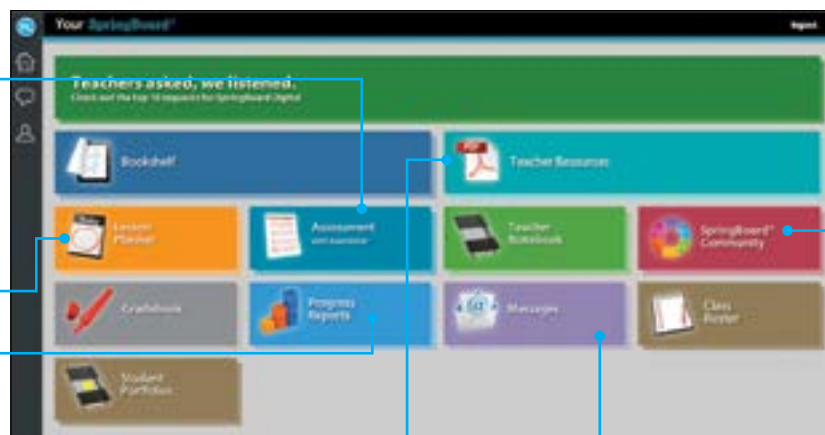
for teachers include Lesson Planner, Teacher Notebook, Class Manager, and Gradebook.

## Reports

cover student performance, standards mastery, item analysis, and trend data.

## Differentiation Resources

provide personalized instruction, additional unit practice, mini-lessons, and Spanish/English Glossary.



## Teacher Resources

are just a click away and include blackline masters, graphic organizers, parent letters, and reproducible manipulatives.

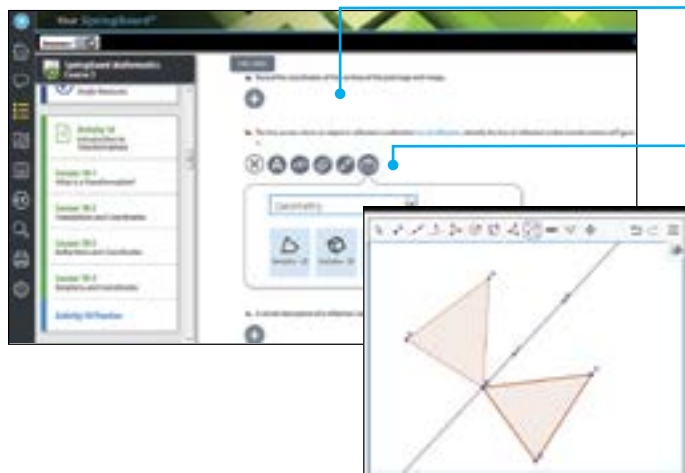
## Communications Tools

enable messaging and portfolio development, and provide a channel for teacher-to-student feedback.

## The SpringBoard Online Community

connects educators with a peer-to-peer Online Learning Community and resources, including a video for sharing best practices and addressing daily instructional needs.

Interactivity enriches teaching and learning.



## Editable

Student and Teacher Editions with interactive text-marking tools (underline, circle, highlight, sticky notes).

## Interactive Mathematic Tools

are available, such as GeoGebra dynamic software and probability tools, virtual algebra tiles, a graphing calculator powered by Desmos, a protractor, and more. These support the Mathematical Practices and Processes.

## Videos at Point of Use

cover mathematical background, pedagogy, and program support to aid successful implementation.

For more information about SpringBoard Mathematics, go to [collegeboard.org/springboard](http://collegeboard.org/springboard) or call us at **877-999-7723**.

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