

SpringBoard High School Mathematics from the CollegeBoard
High School Math- Algebra 1, Geometry, Algebra 2 Series
Publisher Response to Ed Reports Common Core Program Review

Program and Pedagogy

The SpringBoard Algebra 1, Geometry, Algebra 2 Traditional series for high school is a comprehensive and flexible curriculum that supports schools making the transition to the Common Core State Standards at 9-12. The mission of the CollegeBoard is *to challenge students to own their own future*. This SpringBoard series stays true to this mission in providing students with a rigorous college and career ready curriculum that follows Advanced Placement learning principles and design.

In developing our new Common Core edition of SpringBoard High School Math- Traditional series, we aimed to design a scope & sequence and materials that covered the scope of the Common Core Standards for each course as laid out in Common Core Appendix A, while also providing opportunities for differentiation, building foundations, and enrichment within the core instruction and through ancillary resources. As cited in the summary report, the program also covers the plus standards (+) in the scope of the appropriate course where applicable. Our Understanding by Design approach, gives teachers an instructional model to build sufficient connections between the strands and foster student accountability for conceptual understanding, supporting that mission for students to “own their own future”.

For example, each Unit contains approximately 2-3 Embedded Assessments, which are performance based tasks. Using the Understanding by Design model, students and teachers collaboratively preview and unpack each Embedded Assessment prior to beginning that Unit chunk. During this process, students are able to identify and connect previous topics, including those mastered in grades 6-8, to upcoming concepts. The unpacking exercise is further enhanced with student created visual representations showing these concepts and connections to topics within the Unit and from previous grades or units. The unpacked Embedded Assessment allows students to focus on the skills and knowledge that they will be responsible for throughout the unit and supports coherence within and among concepts. Support for students and teachers in meeting these objectives is provided in the Unit Overview, Unit Teacher Support Videos on Springboard Digital, Professional Learning opportunities, and online modules. See the Planning the Unit pages in the Teacher Edition and the Unit Overview pages in the Student Edition and Teacher Edition for all Units-- and connect these to the Assessment Focus noted on the Embedded Assessments.

Gateway 1**Focus and Coherence**

Criterion (1A-1F) *“The instructional materials are coherent and consistent with the high school standards that specify the mathematics which all students should student in order to be college and career ready.”*

Indicator 1a.i

In response to the Ed Reports review, evidence of Standard G-SRT.1b can be found in Geometry Unit 3: Lesson 17-1 and 17-2 in the Activity Practice and in Unit 5: Unit 5: Lesson 32-3 Activity Practice.

The standards that were seen as partially met due to lack of student opportunity to prove certain aspects stated in the standards can be enhanced and enriched with the ancillary resources such as Mini Lessons, Getting Ready Practice, and Additional Practice accessed on SpringBoard Digital. In addition, the suggested Learning Strategies that appear in the Student Edition and Teacher Edition provide a variety of ways through collaboration, reading and writing, and problem solving to give students the opportunity to provide certain aspects stated in the standards. Also, our performance based Embedded Assessments (EA) allow for student opportunities to demonstrate and prove understanding. For Standard A-REI.11 see these Embedded Assessments in Algebra 2- Unit 1 EA 1, Unit 4 EA 3, and Unit 5 EA 3.

Indicator 1a.ii

The Common Core State Standards for Mathematics (CCSSM) classify modeling as a K–12 standard for mathematical practice and as a conceptual category for high school (CCSSI 2010, p. 7). CCSSM also describes mathematical modeling as “the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions” (CCSSI 2010, p. 72). Highlighted opportunities for students to engage in the full modeling process include Algebra 1 Lesson 10-3. In this lesson, students conduct the experiment, gather their own data (all groups will get varied data and results), use their data to model the situation by creating a graph and an algebraic equation, and make predictions for the height of a stack with a certain number of cups. In Geometry Unit 5, Activity 36, students derive formulas for the surface area and volume of a sphere. This requires testing their models and making modifications as needed based on testing with different circles. Moreover, students are introduced to spherical (a non-Euclidean) geometry in which they make models and record observations. In Geometry, Activity 37, students write, test, and modify their conjectures based on changing dimensions of figures. Finally in Algebra 2 Lesson 35-1, Modeling Periodic Phenomena, students write a trigonometric function to model a real world scenario.

Indicator 1c and 1d

This indicator looks at the level of sophistication appropriate to high school. The SpringBoard scenario based content makes connections to real world applications and does not intentionally use gratuitous labeling for teachers or students, so as not to interrupt the flow of instruction.

The SpringBoard Materials connect supporting and major cluster content through meaningful problem scenarios and applications so coherence is deeply embedded and enhanced throughout the year. The Planning the Unit and Unit Overview pages allow the teacher to foster connections up front during the Getting Ready Exercises and while Unpacking the Embedded Assessment. SpringBoard provides Teacher to Teacher tips and guidance in the teacher wrap on furthering those connections. Our Professional Learning services provide a wide array of courses to further support teachers in implementation of the mathematical shifts.

Indicator 1f

The Materials explicitly identify and build on knowledge from Grades 6-8 to the High School Standards. The Getting Ready Exercises that are described in the SpringBoard Alignment report provide teachers with a metric for determining prerequisite mastery or deficiency to make instructional modifications. At the beginning of each Unit there is also reference in the Teacher's Edition to the Getting Started Practice available on SpringBoard Digital. These resources offer a worked out example and instructional practice to build proficiency of the foundational concepts and further support the grade level content progressions. These can be used throughout the instructional unit for more emphasis or building coherence as needed.

Gateway 2**Rigor and Mathematical Practices**

The mathematics instruction in SpringBoard follows a balanced approach in which concepts are presented based on the most effective methods: **Directed** for basic mathematics principles, including examples and practice; **Guided** for concepts that need a combination of direct instruction and investigatory learning; and **Investigative** activities that allow students to explore and discover mathematics concepts through a contextual setting. You will see a balance of these activity types throughout the instruction.

The Standards for Mathematical Practice are truly embedded within the SpringBoard instructional design. They are evident in the Problem Solving, Collaborative, Reading, and Writing Strategies that are called out in the Student and Teacher Editions for each Activity as well as at point of use in the problem sets, practice, Embedded Assessments, and Checks for Understanding. In any given chunk of instruction and practice problems, students are provided with diverse questions that include open ended opportunities to write, explain, reason, construct arguments, and justify in each of our Guided, Directed, and Investigative Activities. There is support in the Teacher Edition wrap on implementation and support of these strategies that are in close alignment with the mathematical practices. In addition, our Professional Learning opportunities provide guidance for teachers in effective implementation of the Practices.

Our writers were very mindful in integrating and labeling the Mathematical Practices so that they could provide focused opportunities for students and teachers to place emphasis on them. SpringBoard uses a pedagogically intrinsic model with the Mathematical Practices; they should not be looked at in isolation, but as a standard for building positive habits of mind within the instructional content. Most of our embedded Learning Strategies embody the Mathematical Practices such as Construct an Argument, Critique Reasoning, Create Representations, Visualization, and Predict and Confirm, just to call out a few.

We feel that tools, representations, and manipulatives greatly improve a student's conceptual understanding of the standards and supports building proficiency of the Standards for Mathematical Practice. SpringBoard offers suite of virtual tools at point of use for every problem that are categorized by domain: Algebra, Geometry, Number Concepts, and Probability & Statistics. These can be accessed in SpringBoard Digital. Click/Tap on the + sign icon and then

the "toolbox" icon to see the array of virtual tools to support procedural skill and fluency. (i.e. Algebra Tiles, Number Line, Protractor, Graphing Calculator powered by Desmos, GeoGebra Dynamic Software, Probability instruments, and an array of data displays).

In Summary, SpringBoard High School Mathematics- Traditional series was developed to meet the rigors of the Common Core State Standards with a focus on developing conceptual understanding through rich problem solving opportunities and embedded student-centered learning strategies.