

SpringBoard Mathematics from the CollegeBoard
High School Math- Traditional Series- Algebra 1, Geometry, Algebra 2
Instructional Design, Foundational Research, and Professional Services

SpringBoard is the CollegeBoard's comprehensive instructional program for all students. SpringBoard's Traditional High School Series- Algebra 1, Geometry, Algebra 2 is a highly engaging, student-centered mathematics curriculum that provides access to the rigorous Common Core State Standards for high school. In **Algebra 1** students gain an understanding of the properties of real numbers; formalize the language of functions and explore them numerically, graphically, analytically, and verbally; use technology to discover relationships, test conjectures, and solve problems; write expressions, equations, and inequalities from physical models; and communicate understanding formally and informally through a variety of contexts and activities. In **Geometry** students read, analyze, and solve right triangle and trigonometric functions within contextual situations; develop area formulas necessary for determining volumes of rotational solids, solids with known cross sections, and area beneath a curve; explain work clearly so that the reasoning process can be followed throughout the solution. In **Algebra 2** students develop the Algebra of functions; read and analyze contextual situations involving exponential and logarithmic functions; work with functions, graphically, numerically, analytically, and verbally; learn optimization problems; compare the relative rate of change of linear and exponential functions; learn the concept of infinite sum as a limit of partial sums; work with statistics in numerical summaries, calculation using the normal curve, and modeling of data. The program prepares learners for the essential courses, including Advanced Placement, that lead to college and career success.

SpringBoard offers a flexible and comprehensive pathway with a consumable, interactive write-in print text, as well as an interactive digital platform, SpringBoard Digital. SpringBoard follows the Plan, Teach, Assess, Adapt instructional model with ongoing formative assessment, including Embedded Assessments, which are performance based tasks that students and teachers "back map to" in a collaborative exercise called "*Unpacking*" to determine the skills and concepts they will be accountable for in each one. The use of differentiated learning strategies promotes an environment where students are active participants and teachers are effective facilitators.

SpringBoard was designed from the start to meet the needs of rigorous standards and built on current research of positive instructional practices. Utilizing the Understanding by Design model by Wiggins and McTighe, SpringBoard uses a backward mapping instructional design that starts with the end in mind, namely, the Embedded Assessments. The skills and knowledge needed for these assessments are scaffolded into the activities leading to each assessment. By using the Embedded Assessment as a starting point for planning instruction, teachers have a clear picture of what students need to know and be able to do as they progress through the unit to more easily adjust the learning plan to meet individual needs.

SpringBoard's lesson design also takes into account the work by M. McLaughlin in our focus on cognitive engagement. Students seamlessly move from understanding and comprehension, to analysis, and are ultimately asked to synthesize or create in their Embedded Assessments. Similarly, the structure of each lesson's teacher guide allows for the type of facilitation and flexibility referenced by Charlotte Danielson in her work on teacher instruction.

Based on their review of the research, Marzano and Pickering advocate that the way to close the achievement gap is by building students' background knowledge especially in the area of Academic Vocabulary development. Academic Vocabulary is identified and taught via direct instruction using such strategies as marking the text, word walls, and graphic organizers,

SpringBoard is also informed by Robyn Jackson's work on rigorous instruction. As Jackson suggests, our content requires students to be "active, not passive" and our materials are characterized by activities that stress "implicit meaning, ambiguity, layers, or complexity". In addition, our Embedded Assessments ask students to demonstrate mastery of skills rather than factual recall. SpringBoard teamed with Jackson to develop a working definition of rigorous instruction and we use that definition throughout our trainings with administrators and instructional leaders.

The concepts developed in the SpringBoard Mathematics program follow a balanced approach of direct, guided, and investigative instruction based on the best means of helping students grasp new concepts and apply them in a variety of contexts. Direct instruction is used for basic knowledge and includes worked-out examples and practice problems. Investigative activities require students to explore concepts through discussion and collaborative work as they derive understanding of the principles they are learning. Guided activities are a mixture of direct and investigative instruction based on the needs of the content being presented. Using principles of cognitive learning, SpringBoard requires students to compare, select, organize, retain, and reflect on new information as patterns of understanding are revised and adapted. This strategic instructional approach supports student acquisition of the skills outlined by the Standards for Mathematical Practice focused on problem solving, reasoning and proof, communication, connections, and representations. With an instructional framework that develops both content and Practice standards, SpringBoard equips teachers with the resources to deliver effective instruction and students with the knowledge, skills, and strategies to achieve high levels of learning. The program is built on the same rigorous strategies and skills found in Advanced Placement (AP) classes.

SpringBoard activities are structured to engage all students in active learning through discussion, partnering, and group work. Embedded in activities are opportunities for teachers to introduce and model strategies that give students tools that help them take ownership of their own learning. There are specific strategies for collaboration and communication such as Discussion Groups, Think-Pair-Share, Critique Reasoning, and Sharing and Responding. Finally, the balanced structure of the activities supports both student-student and teacher-student interaction with the investigative, guided, and directed formats. SpringBoard Digital mirrors these with messaging tools and an interactive virtual workspace.

SpringBoard provides a variety of assessment formats to meet the needs of all districts. The hallmarks of the curriculum are the Embedded Assessments that appear in each Unit. These are performance based tasks that are visible to both the teacher and student as they begin each Unit. There are about 2-3 Embedded Assessments in each Unit and are evaluated using a scoring rubric criteria that measures mastery of content as well as the Math Practices. In addition, there are daily opportunities for formative assessment through observations and Checks for Understanding. PreAssessment opportunities include Getting Ready exercises at

the beginning of each Unit that are tied to prerequisite skills and standards. Additional opportunities for filling in gaps or building foundations are provided with Getting Ready Practice.

In addition, the summative assessment opportunities include Unit Assessments that can be administered online or in print. Additional short cycle assessments are available and can be used as necessary throughout each Unit. Finally, teachers can evaluate and grade each of the assigned problem chunks and practice as they desire. They can determine the evaluation and grading scale as well through SpringBoard Digital.

SpringBoard offers robust data and progress reporting functionality through SpringBoard Digital. A variety of reports can be generated, including class average, performance, standards mastery, and more. Any assignment or assessment that has been graded will be fed into the progress report functionality. The reporting feature provides teacher and administrator roles for a variety of reporting types and data for their purposes. Teachers have real time visibility and can communicate and message back and forth with students to monitor their progress and provide appropriate feedback.

SpringBoard offers research-based strategies and practices to support and advance special populations, including Sped, English language learners, accelerated learners and struggling learners at all levels. The focus on vocabulary and language is particularly beneficial to ELL students.

Here are highlights of the program design:

- The Unit Overview identifies key concepts students will learn in the unit.
- Learning Objectives are aligned to the CCSS and set clear learning goals for each activity in student friendly language.
- The Essential Questions lay out the key objectives students will master in the unit.
- Getting Ready helps students identify the knowledge they will need to be successful in their study of the unit and connects to prerequisite skills.
- Scoring Guides help students understand expectations for performance on Embedded Assessments.
- Check Your Understanding, Practice, and Activity Practice provide multiple opportunities to evaluate understanding, monitor student progress, and provide feedback. Students are asked to communicate their mathematical reasoning by justifying and explaining.
- Mini-Lessons for additional opportunities to develop foundational concepts and differentiate instruction.

SpringBoard provides a comprehensive suite of professional learning opportunities for teachers, coaches, and administrators. The goals of the interactive, face-to-face professional development and implementation support services include:

- Modeling and practice
- Scoring student work
- Engaging students
- Collaborative activities
- Integration of SpringBoard Digital
- Vertical articulation
- Alignments to Advanced Placement

- Differentiated Instruction

For Teachers:

Teachers engage deeply in an interactive examination of SpringBoard's instructional design. SpringBoard training sessions provided expert modeling followed by direction application to classroom planning and instruction.

For Instructional Coaches:

Training for coaches builds foundational understanding of the program's instructional design and presents strategies to help them coach teachers on how to plan, implement, and assess.

For Administrators:

Administrators examine the key components of SpringBoard, including instructional design, direct connections to rigorous standards, and ways to look for and sustain effective instruction.