CollegeBoard SpringBoard

Instructional Design, Foundational Research, and Professional Services
SpringBoard Integrated Mathematics Series

SpringBoard is the College Board's comprehensive instructional program in mathematics for all students in grades 6-12. *SpringBoard Integrated Mathematics I, II,* and *III* is a highly engaging, student-centered mathematics curriculum that provides access to the rigorous Common Core State Standards in Mathematics for high school. In ***Integrated Math I***, students gain an understanding of the properties of real numbers; formalize the language of functions and explore their behavior numerically, graphically, analytically, and verbally; compare the relative rate of change of linear and exponential functions; use technology to discover relationships, test conjectures, and solve problems; write expressions, equations, and inequalities from physical models; summarize, represent, and interpret statistical models, and; communicate mathematics understanding formally and informally. In ***Integrated Math II***, students continue their work with functions; read, analyze, and solve right triangle and trigonometric functions within contextual situations; explore and understand similarity in terms of transformations and prove geometric theorems; explain work clearly so that the reasoning process can be followed throughout the solution; utilize technology to solve problems, and; understand and use the rules of probability to compute probabilities and evaluate outcomes of decisions. In ***Integrated Math III***, students develop further the algebra of functions; read and analyze contextual situations involving exponential and logarithmic functions; develop area formulas necessary for determining volumes of rotational solids, solids with known cross sections, and areas beneath curves; learn optimization problems; learn the concept of infinite sum as a limit of partial sums; work with statistics in numerical summaries, calculations using the normal curve, and the modeling of data, and; apply technology to solve problems. This series prepares learners for essential courses, including Advanced Placement (AP®), 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 (EAs), which are performance-based tasks that students and teachers "back map to" in a collaborative exercise called "Unpacking the EA" to determine the skills and concepts they will be accountable for in each EA. 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 EA 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 Integrated Mathematics series 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 foundational 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 (SMP) 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 AP classes.

SpringBoard activities are structured to engage all students in active learning through discussion, partnering, and group work. Embedded in the 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 approach 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 of instruction. These are performance-based tasks that are visible to both the teacher and students as they begin each Unit. There are about two to four EAs in each Unit, and an accompanying scoring rubric sets the criteria that measures mastery of content as well as the SMP. In addition, there are daily opportunities for formative assessment through observations and Check Your Understanding items. Pre-Assessment 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 in the Getting Ready Practice pages online.

In addition, the summative assessment opportunities include End-of-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 Special Education, English language learners, accelerated learners, and struggling learners at all levels. The emphasis on mathematical vocabulary and language development is particularly beneficial to English learners

Here are highlights of the program design:

- The Unit Overview identifies key concepts students will learn in the Unit.
- Learning Targets are aligned to the CCSS-M and set clear learning goals for each lesson in student-friendly language.
- Essential Questions lay out the key objectives students will master in the Unit.
- Getting Ready exercises help students identify the knowledge they will need to be successful in their study of the Unit and connects to prerequisite skills.
- A Scoring Guide helps students understand expectations for performance on each Embedded Assessment.
- Check Your Understanding, Lesson 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 provide additional opportunities to develop foundational concepts and differentiate instruction.

SpringBoard provides a comprehensive suite of Professional Learning opportunities for teachers, instructional coaches, and administrators. The goals of the interactive, face-to-face professional development and program 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 provide expert modeling followed by direct 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.

If you would like more information about the SpringBoard Integrated Mathematics series, please visit https://springboard.collegeboard.org/.