BOOTSTRAP
www.bootstrapworld.org

Bootstrap is a family of research-based curricula that teach Computer Science in a way that can be integrated with **Algebra**, **Statistics, Business, Science** & **Social Studies**

Flexible options: Not every school has money for a CS teacher or room for a CS course! Our curricula can be mixed-and-matched to form endless variations that take anywhere from 25 hours to a full year. Our modules build seamlessly, allowing schools to *grow their CS offerings gradually*, or dive straight into AP CS. Teachers without prior CS experience start comfortably and confidently after our Professional Development.

Equitable access: Our materials are developed so they can integrate into mainstream classes - not just computing classes! As a result, our curriculum delivers rigorous and engaging computing to every student, not those who self-select. *Of the 10s of thousands of students we reach each year, 46% are African-American or Latino/a, and 43% are female.*

Real Results: Algebra underlies all STEM careers. Bootstrap uses computing to help students see value and gain confidence in algebra. We assess our effectiveness using questions from state algebra exams. *Bootstrap:Algebra has been shown to significantly improve student performance on standard, pencil-and-paper algebra tasks.* Read more at BootstrapWorld.org/impact.

To offer Bootstrap, a school needs:

- **A trained teacher**: We provide in-person PD and online follow-up PD, and we support teachers with email, phone calls, and discussion groups; on-site visits are also possible. We welcome and encourage multiple teachers from the same school.
- **Printed materials**: Schools purchase workbooks, or can print their own from our free PDFs.
- **Minimal computer access**: Not every teacher has full-time access to a lab, and we understand. Our curricula use a paper-and-pencil workbook, which reinforces our pedagogy, and supports teachers with only limited access to computers.
- **Web access**: There's *nothing to install*; everything runs on the Web. It works on Chromebooks, laptops, and desktops, and has support for the visually-impaired.

Cost: $1500/teacher for training at CSPdWeek. All software, support and materials are completely FREE.
    $1000/teacher for stipend at CSPdWeek.

For more information: Write to contact@BootstrapWorld.org, or visit our website (BootstrapWorld.org)

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Algebra

Bootstrap:Algebra applies algebraic concepts and rigorous programming principles to creating a simple videogame. Students use order of operations, function composition, the distance formula, coordinates and inequalities in the plane to detect collisions, handle keystrokes, and determine how they move and interact – with each challenge framed as a standard word-problem. The module is aligned to National & State Standards for Mathematics, the CSTA standards and K12CS frameworks, and has been shown to improve students' performance on standards algebraic tasks (see BootstrapWorld.org/impact).
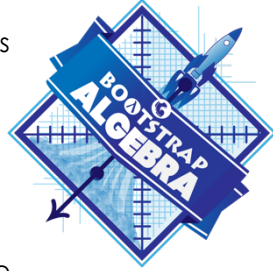
Data Science

Which artist do you listen to most? Do schools in richer areas of your town do better than those in poorer ones? What's the healthiest cuisine? *Bootstrap:Data Science* teaches students to view programs as questions we ask of data. Students form their own questions about the world around them, and learn to analyze data critically and carefully to find answers. Business, science, and history teachers can utilize this module to help students make inferences from data. Math teachers can use this module to introduce statistics in an accessible way. It also works great as a module for AP CS Principles' unit on data!

Physics

This module is developed in partnership with the American Association of Physics Teachers & American Modeling Teachers Association. It helps students understand dynamics concepts by using programming to build models of the physical world. The module is targeted at ninth grade, a year in which every student is expected to take science. The module is aligned to the Physics First movement, allowing teachers to present computational modeling as a basic tool to students preparing to study science more broadly.
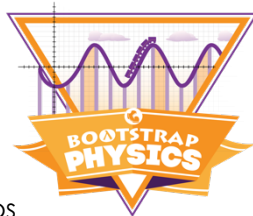
Reactive

Bootstrap:Reactive goes deeper into programming, building events and data structures on top of the foundation laid by our intro courses and allowing students to build far more sophisticated programs. Students learn how the event loop that drives their Bootstrap:Algebra game works, and use it to create animations using simple datatypes. They then learn about data structures, and design a structure for a sophisticated game of their own design. Bootstrap:Reactive is aligned to the CSTA standards and K12CS frameworks.

Bootstrap is based at Brown University, and builds on the research and development done there. We are proud to work with one of the world's top institutions for Computer Science.

BROWN
UNIVERSITY