Last updated: Feb. 24, 2022
NEW ITEMS ARE NOTED IN RED

Background Context

The CS4RI initiative, launched by Governor Raimondo in March 2016, began with the original goal to have computer science taught in every public school in the state. We can now say that students across the state have access to quality computer science opportunities in all of our schools. In 2015, only 1% of RI high school students enrolled in CS courses and 42 students took the AP CS A exam. Of these students, just 26 students, $^{3}/_{4}$ of whom were white males, passed. Zero black and Hispanic public-school students took the exams. Fewer than 350 students graduated with a bachelor's degree in CS at a period when there were over 1,000 open computing jobs. That same year, the Rhode Island Brookings Report identified that CS, IT, and STEAM jobs were among the state's fastest growing and best paying positions and that the state was not doing enough to develop a workforce with the skills necessary to fill these high-wage, high-growth jobs. The CS4RI initiative has focused on providing CS curriculum and professional development to all RI schools, building educator capacity, developing rigorous and sustainable K-12 CS pathways, and building demand for CS education.

Just a year and a half into the initiative, 100% of districts offered CS opportunities in varying degrees and more 650 RI educators have received training. In December 2018, the Governor set a new and even more ambitious goal to double the number of Computer Science degree graduates in our state by 2025. While there were over 1,300 open CS jobs in the state last year, RI produced just over 800 CS graduates. Even more critically, by 2020 projections show that there will be more than 2,500 open jobs in CS in RI. As a result, she has challenged every public-school administrator, teacher, parent, and student to ensure that every single student takes a rigorous Computer Science course by the time they graduate high school. Every one of our kids deserves rigorous, sustained and comprehensive exposure to computer science education.

Data collection around computer science programs is critical with the increased focus and additional resources supporting computer science both locally here in Rhode Island, and in the national arena. Rhode Island is poised to take advantage of numerous opportunities including the Department of Education's $200 million dollar investment in computer science education. This will require accurate information to inform programmatic decisions as well as being able to develop new baselines and track the impact of investments.

Frequently Asked Questions

How is CS4RI Data Collected?

The **Teacher / Course / Student** (TCS) system already in place allows for accurate data collection. RIDE is currently looking closely at courses supported by the CS4RI matrix and is counting these courses. The courses are offered across the grade levels (K-12) as full year courses or integrated into various content areas. In the 2018-19 school year, two new fields were added to the **SECTION file** in the TCS data collection. These fields are necessary for the CS4RI initiative.

What TCS - COURSE Data Elements do I need to focus on?

The **Local Course ID** and the **Local Course Title** are assigned at the local level. RIDE primarily determines CS4RI implementation based on the **SECTION information**. (See Notes on SECTION Data Elements) However, based on past practice by districts, the CS4RI SCED Codes are typically one of the following listed in the table below. The table is provided as guidance. The appropriate SCED Code is best determined by the district.

SCED Course Title	SCED Code	SCED Code Description
Computer Mathematics with Algebra	02156 **OR** **Algebra SCED CODE**	Intended for students who have attained the objectives of Algebra I, Computer Mathematics with Algebra courses include a study of computer systems and programming and use the computer to solve mathematics problems.
Computer Science Principles	10011	Computer Science Principles courses provide students the opportunity use programming, computational thinking, and data analytics to create digital artifacts and documents representing design and analysis in areas including the Internet, algorithms, and the impact that these have on science, business, and society. Computer Science Principles courses teach students to use computational tools and techniques including abstraction, modeling, and simulation to collaborate in solving problems that connect computation to their lives.
Exploring Computer Science	10012	Exploring Computer Science courses present students with the conceptual underpinnings of computer science through an exploration of human computer interaction, web design, computer programming, data modeling, and robotics. While these courses include programming, the focus is on the computational practices associated with doing computer science, rather than just a narrow focus on coding, syntax, or tools. Exploring Computer Science courses teach students the computational practices of algorithm design, problem solving, and programming within a context that is relevant to their lives. **Note: This is the code to use for URI's Intro to Computing and Data Science course.**
PLTW Computer Science Essentials	10013	Following Project Lead the Way's suggested curriculum, PLTW Computer Science Essentials (formerly known as PLTW Introduction to Computer Science) courses introduce students to computational thinking concepts, fundamentals, and tools. Students will increase their understanding of programming languages through the use of visual and text-based programming. Projects will include the creation of apps and websites to address real-life topics and problems.
PLTW Computer Science A	10014	Following Project Lead the Way's suggested curriculum to prepare students for the College Board's Advanced Placement Computer Science A exam, PLTW Computer Science A (formerly known as PLTW Computer Science Applications) courses focus on extending students' computational thinking skills through the use of various industry-standard programming and software tools. In these courses, students collaborate to design and produce solutions to real-life problems.

PLTW Computer Science Principles	10015	Following Project Lead the Way's suggested curriculum to prepare students for the College Board's Advanced Placement Computer Science Principles exam, PLTW Computer Science Principles (formerly known as PLTW Computer Science and Software Engineering) courses are designed to help students develop computational thinking and introduce students to possible career paths involving computing. These courses help students build programming expertise and familiarity with the Internet using multiple platforms and programming languages. Course content may include application development, visualization of data, cybersecurity, and simulation.
PLTW Cybersecurity	10016	Following Project Lead the Way's suggested curriculum, PLTW Cybersecurity courses introduce students to the tools and concepts of cybersecurity. In these courses, students are encouraged to understand vulnerabilities in computational resources and to create solutions that allow people to share computing resources while retaining privacy. These courses also introduce students to issues related to ethical computing behavior.
AP Computer Science Principles	10019	Following the College Board's suggested curriculum designed to parallel college-level computer science principles courses, AP Computer Science Principles courses introduce students to the fundamental ideas of computer science and how to apply computational thinking across multiple disciplines. These courses teach students to apply creative designs and innovative solutions when developing computational artifacts. These courses cover such topics as abstraction, communication of information using data, algorithms, programming, and the Internet, global impact.
Cybersecurity	10020	Cybersecurity courses introduce students to the concepts of cybersecurity. These courses provide students with the knowledge and skills to assess cyber risks to computers, networks, and software programs. Students will learn how to create solutions to mitigate cybersecurity risks. These courses may also cover the legal environment and ethical computing behavior related to cybersecurity.
Computer Science Discoveries	10021	Computer Science Discoveries is a highly interactive and collaborative introduction to the field of computer science. The course takes a wide lens on computer science by covering topics such as problem solving, programming, physical computing, user centered design, and data. Students build their own websites, apps, animations, games, and physical computing systems. Students create and share their own content to meet various design challenges, as well as implement computational solutions to problems that impact their communities. Along the way, they practice design, testing, and iteration, as they come to see that failure and debugging are an expected and valuable part of the programming process.
AP Computer Science A	10157	Following the College Board's suggested curriculum designed to mirror college-level computer science courses, AP Computer Science Applications courses emphasize object-oriented programming methodology with a focus on problem solving and algorithm development. These courses cover such topics as object-oriented program design; program implementation; program analysis; standard data structures; standard algorithms; and the ethical and social implications of computing systems.
Computer Programming – Workplace Experience	10198	Computer Programming—Workplace Experience courses provide students with work experience in fields related to computer programming. Goals are typically set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses may include classroom activities as well, involving further study of the field or discussion regarding experiences that students encounter in the workplace.
Computer Programming – Other	10199	Other Computer Programming courses.

Robotics	21009	Robotics courses help students develop and expand their skills and knowledge of robotics and related scientific and engineering topics. Course topics may include principles of mechanics, electronics, hydraulics, pneumatics, programmable logic controllers. These courses may emphasize the use of engineering principles to design and build robots, construct and connect sensors, and program robots in the programming language.

If you would like to view only course codes specific to high school grant courses, please visit CS4RI.org/hsgrant.

What TCS – SECTION Data Elements do I need to focus on?

The **Local Section ID** and the **Local Course ID** are assigned at the local level. Identify stand-alone full year or semester-long High School and Middle School Computer Science Courses with a **CS4RI Partner Code [CS4RIPARTNERCODE].** Use the information found in the table below for the **CS4RI Partner Codes**.

CS4RI Partner Codes	Item Value	Value Name	Definition / Description	Typical Grade Band
	**BOOTSTRAP**	Bootstrap	CS4RI Matrix Partner offering Computer Science course content integrated into existing algebra course	Grades 8-10
	TEALS	TEALS	CS4RI Matrix Partner offering Intro to Computer Science Programming and AP Computer Science Applications	Grades 9-12
	URI	URI	CS4RI Matrix Partner offering Intro to Computing and Data Science	Grades 9-12
	URICODE	URI / Code.org	CS4RI Matrix Partner offering AP Computer Science Principles	Grades 9-12
	URIDISC	URI / Code.org Discoveries	CS4RI Matrix Partner offering Code.org Computer Science Discoveries	Grades 6-9 Grades 9-12
	PLTW-G	PLTW Gateway	CS4RI Matrix Partner offering Gateway – Design and Modeling, Automation and Robotics, App Creator, and Computer Science for Innovators and Makers	Grades 6-8
	PLTW-E	PLTW-Essentials	CS4RI Matrix partner offering Computer Science course covering the major topics, big ideas, and computational thinking practices used by computing professionals to solve problems.	Grades 6-8
	PLTW-CSP	PLTW Computer Science Principles	CS4RI Matrix Partner offering AP Computer Science Principles	Grades 9-12
	PLTW-CSA	PLTW Computer Science A	CS4RI Matrix Partner offering AP Computer Science A	Grades 9-12
	OTHER	Other		Grades 7-12
	CS4RI-WBL	CS4RI Work-Based Learning	CS4RI Matrix Partner, URI, offering project-based learning computer science course	Grade - 10

How is a COURSE defined?

A course, as defined in the Secondary Regulations, is a connected series of lessons and learning experiences that:

a) Establishes expectations defined by recognized content standards;
b) Provides students with opportunities to learn and practice skills; and,
c) Includes assessments of student knowledge and skills adequate to determine proficiency at the level of academic rigor required by relevant content standards.

How is it reported when CS content is integrated into a course rather than delivered in a stand-alone course?

Elementary and Middle School level CS content is often integrated into core classwork rather than delivered as a stand-alone course. Identify integrated computer science programs with an **Integrated Computer Science Program Code(s) [INTCSPROGRAMCODE]** listed in the table below.

Int. CS Program	Item Value	Value Name	Definition / Description	Typical Grade Band
	CS4RI2101	Code.org - CS Fundamentals	CS4RI - CS Fundamentals integrated into (Math, ELA, Sci, SS, Library, etc.) Instructional units comprised of 12 - 24 lessons integrated across K-5 curriculum in which students learn CS fundamentals by engaging in both online and offline CS activities.	Grades K-5
	CS4RI2102	Copernicus - Creative Computing with Scratch Jr.	CS4RI - Copernicus - Creative Computing with Scratch Jr. K-2 integrated into (Math, ELA, Sci, SS, Library, etc.) instructional units integrated into existing curriculum in which students use a drag and drop programming language to code, create, and share interactive stories, animations, games, music, and more as they learn problem solving and other fundamental CS concepts.	Grades K-2
	CS4RI2103	Coding as Another Language Curriculum - Scratch Jr.	CS4RI – Coding as Another Language –Scratch Jr. K-2 Utilizing the Coding as Another Language Curriculum, students learn fundamental CS concepts through 24 lessons that include unplugged activities and the plugged activities with the Scratch Jr. App. Curriculum can be delivered as part of Math, ELA, Sci, SS, STEAM/STEM or Library classes by classroom or special area teacher)	Grades K-2
	CS4RI2140	PLTW - Launch	CS4RI - PLTW - Launch integrated into (Math, ELA, Sci, SS, Library, etc.) 8 instructional modules totaling ~80 hours of content integrated across grades K-5. PLTW's entire K-12 CS experience involves interdisciplinary learning; exposing students not only to computer science, but to various disciplines and subjects, helping them understand how computer science relates to the world around them.	Grades K-5

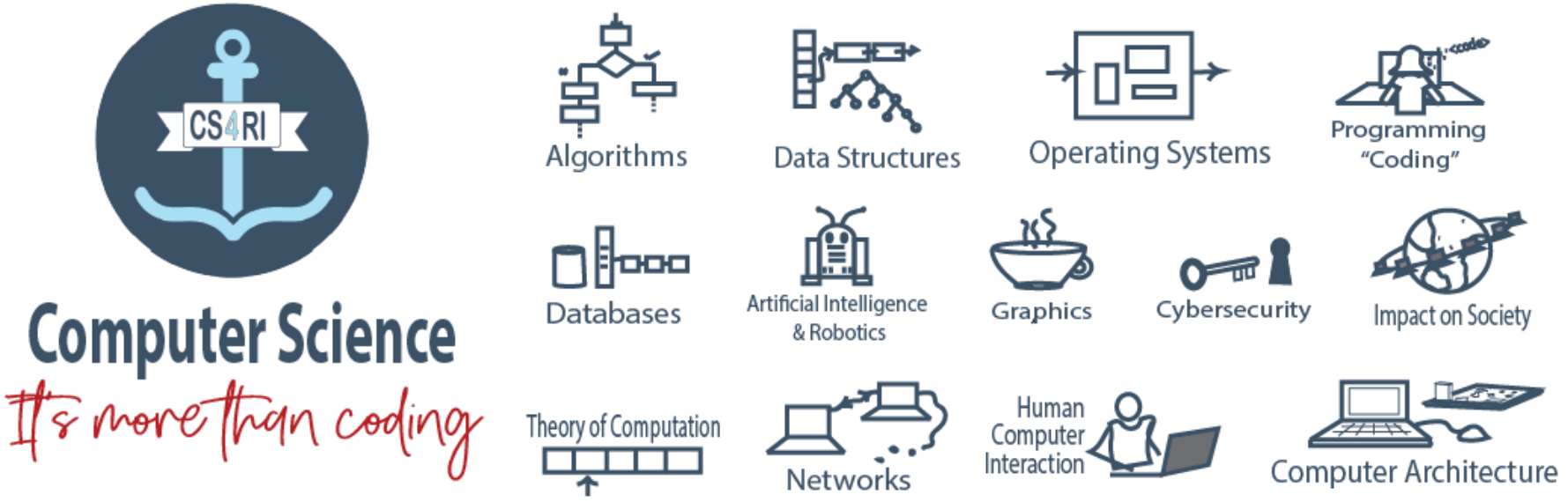
	**CS4RI2201**	Copernicus - Creative Computing with Scratch	CS4RI - Copernicus - Creative Computing with Scratch integrated into (Math, ELA, Sci, SS, Library, etc.) instructional units integrated into existing curriculum in which students use a drag and drop programming language to code, create, and share interactive stories, animations, games, music, and more as they learn problem solving and other fundamental CS concepts.	Grades 3-8
	**CS4RI2202**	URI - CS Discoveries	CS4RI - Six instructional modules distributed in courses in 6-8th grade. Based on code.org course. Modules include Problem Solving, Internet, Programming, Design, Data, Physical Computing.	Grades 6-8
	**CS4RI2206**	PLTW - Gateway Automation and Robotics	PLTW Gateway integrated unit integrated in grades 6-8; each unit is 45 minutes/45 days of instruction in which students trace the history, development, and influence of automation and robotics as they learn about mechanical systems, energy transfer, machine automation, and computer control systems. Students use the VEX Robotics platform to design, build, and program real-world objects such as traffic lights, toll booths, and robotic arms	Grades 6-8
	**CS4RI2207**	PLTW - Gateway App Creator	PLTW Gateway integrated unit integrated in grades 6-8; each unit is 45 minutes/45 days of instruction exposing students to computer science by computationally analyzing and developing solutions to authentic problems through mobile app development and conveying the positive impact of the application of computer science to other disciplines and to society.	Grades 6-8
	**CS4RI2208**	PLTW - Gateway CS for Innovators and Makers	PLTW Gateway integrated unit integrated in grades 6-8; each unit is 45 minutes/45 days of instruction allowing students to discover computer science concepts and skills by creating personally relevant, tangible, and shareable projects. Students learn about programming for the physical world by blending hardware design and software development. They design and develop a physical computing device, interactive art installation, or wearable, and plan and develop code for microcontrollers that bring their physical designs to life	Grades 6-8
	**CS4RI2302**	Bootstrap - Data Science	CS4RI - 20 hour instructional modules integrated in existing course. 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 to their own compelling problems.	Grades 9-12

Where can the Data Manager find TCS specifications?

Visit the RIDE website for more information on the Teacher Course Student specifications, appropriate submission process, additional data element descriptions, validations, and updates. It is recommended that the Data Manager communicate closely with school leaders (Superintendents and Principals) to determine key CS4RI point people within each district. Fifteen CS4RI districts participated in the CS4RI SCRIPT workshop during the summer of 2018. These CS4RI District contacts are a good resource within those participating districts.

Does a technology class count for CS4RI?

Computer Science is more than coding or a technology class with a focus on applications such as PowerPoint, Word, and Excel. According to the RI State Computer Science Standards, Computer Science is the study of computers and algorithmic processes, including their principles, their hardware and software designs, their implementation, and their impact on society. RIDE is looking at courses that utilize curriculum from our Matrix Partners and are delivered either in a stand-alone or integrated fashion.



Where do I go for more information?

Visit http://CS4RI.org for information about the matrix providers, opportunities for schools, news & events. Contact Holly Walsh (Holly.Walsh@ride.ri.gov) for additional information.