

Unit 06: Coding for First Graders

Content Area: **English Language Arts**

Course(s):

Time Period: **Trimester 2**

Length: **6-9 sessions**

Status: **Published**

Brief Summary of Unit

First grade students will review and continue to build coding and computational thinking through age appropriate websites/manipulatives. Computational thinking is problem solving in an efficient way. It can include knowing how and when to use computing tools, knowing what steps you need to take to solve a problem, and logically organizing and analyzing data.

This unit is designed to be part of a developmental progression across grade levels and make interdisciplinary connections across content areas including physical and social sciences, technology, career readiness, cultural awareness, and global citizenship. During this course, students are provided with opportunities to develop skills that pertain to a variety of careers.

Revision Date: June 2021

Standards

The identified standards reflect a developmental progression across grades/ levels and make interdisciplinary connections across content areas including social sciences, technology, career readiness, cultural awareness and global citizenship. The standards that follow are relevant to this course in addition to the associated content-based standards listed below.

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| I | Inquire: Build new knowledge by inquiring, thinking critically, identifying problems, and developing strategies for solving problems. |
| I.A | Learners display curiosity and initiative by: |
| I.A.1 | Formulating questions about a personal interest or a curricular topic. |
| I.A.2 | Recalling prior and background knowledge as context for new meaning. |
| I.C.1 | Interacting with content presented by others. |
| I.C.3 | Acting on feedback to improve. |
| V.A | Learners develop and satisfy personal curiosity by: |
| IV.B.1 | Seeking a variety of sources. |
| VI.D.1 | Personalizing their use of information and information technologies. |

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| CRP.K-12.CRP1 | Act as a responsible and contributing citizen and employee. |
| CRP.K-12.CRP2 | Apply appropriate academic and technical skills. |
| CRP.K-12.CRP2.1 | Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation. |
| CRP.K-12.CRP4 | Communicate clearly and effectively and with reason. |
| CRP.K-12.CRP8 | Utilize critical thinking to make sense of problems and persevere in solving them. |
| III.D.1 | Actively contributing to group discussions. |
| TECH.8.1.2 | Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. |
| TECH.8.1.2.A | Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations |
| TECH.8.1.2.A.4 | Demonstrate developmentally appropriate navigation skills in virtual environments (i.e., games, museums). |
| TECH.8.1.2.C.CS2 | Communicate information and ideas to multiple audiences using a variety of media and formats. |
| TECH.8.1.2.C.CS4 | Contribute to project teams to produce original works or solve problems. |
| TECH.8.1.2.E.1 | Use digital tools and online resources to explore a problem or issue. |
| TECH.8.1.2.F | Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. |
| TECH.8.2.2 | Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment. |
| TECH.8.2.2.A.CS1 | The characteristics and scope of technology. |
| TECH.8.2.2.A.CS2 | The core concepts of technology. |
| TECH.8.2.2.E | Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge. |
| TECH.8.2.2.E.1 | List and demonstrate the steps to an everyday task. |
| TECH.8.2.2.E.3 | Create algorithms (a sets of instructions) using a pre-defined set of commands (e.g., to move a student or a character through a maze). |
| TECH.8.2.2.E.5 | Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm). |

Essential Questions

- How can I program a coding robot to perform a simple task?
- How can I solve a coding problem on a website to perform a simple task?
- How can I use computational thinking to solve simple problems?
- How does computational thinking allows me to solve simple problems?
- What is computational thinking?

- What vocabulary words are used in computer programming?
- Why is it important to use coding vocabulary appropriately?

Students Will Know/Students Will Be Skilled At

- Programming a coding robot to successfully perform a variety of simple tasks.
- Programming various lessons through code.org.
- Simple problems may be solved with computational thinking.
- To apply existing knowledge to generate new ideas.
- Utilizing age appropriate coding activities to build an understanding of the basics of programming.
- Utilizing coding terms appropriately and regularly during class discussion and group work.

Evidence/Performance Tasks

Students demonstrate differentiated proficiency through both formative and summative assessments in the classroom. Based on individual student readiness and performance, assessments can be implemented as formative and/or summative.

Developmental progression across years in media is evidenced through benchmark assessments as part of the media specialist's Student Growth Objective (SGO). Follow up diagnostic assessments are used to target skill remediation. Student proficiency allows for additional or alternative assessment based on demonstration or absence of skill.

The performance tasks listed below are examples of the types of assessments teachers may use in the classroom and the data collected by the district to track student progress.

- Benchmark - Students demonstrate proficient and appropriate use of coding vocabulary terms.
- Formative - Students independently utilize introductory games/tools that teach the elements of basic coding.
- Formative - Students independently code various lessons utilizing code.org.
- Summative - Students work collaboratively in groups to navigate coding robots through an obstacle course/maze.

Learning Plan

Media Specialists may personalize instruction during this unit and address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students.

Students are exposed to STEM-related activities during this unit allowing them to experience varied disciplines including science and mathematics.

Media Specialists at the elementary level design their own unique lesson plans in order to incorporate the essential

questions provided in this unit. The order in which this information is presented is dependent upon the variables specific to each elementary school community. For example, students may be called to the carpet for a lesson followed by guided practice, then independent practice. After the lesson, students will check out books. Library Media time ends with an electronic story or students going to a makerspace station.

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Code.org coding lessons should be completed in order following the progression of Course A to Course F. Grade 1 should ideally focus on the lessons in Course A.

Course A Lesson Plans can be found at the following link: https://studio.code.org/s/coursea-2021?section_id=3373087
During this unit, students usually do lessons 2-6 in Code.org but can continue lessons if time permit. See below for description and lesson plans:

Course A (2021) Overview:

Course A offers a computer science curriculum for beginning readers, including Kindergarten students. Students will learn to program using commands like loops and events. The lessons featured in this course also teach students to meaningfully collaborate with others, investigate different problem-solving techniques, persist in the face of challenging tasks, and learn about internet safety.

Lesson 1: Safety in My Online Neighborhood -This lesson is used during digital citizenship unit.

Lesson 2: Learn to Drag and Drop

This skill-building lesson will give students an idea of what to expect when they head to the computer lab. It begins with a brief discussion introducing them to computer lab manners, then they will progress into using a computer to complete online puzzles.

Lesson 3: Happy Maps-Unplugged Lesson

This context-setting lesson brings together teams with a simple task: get the "flurb" to the fruit. Students will practice writing precise instructions as they work to translate instructions into the symbols provided.

Lesson 4: Sequencing with Scrat

In this skill-building lesson, students will develop sequential algorithms to move a squirrel character from one side of a maze to the acorn at the other side. To do this they will stack code blocks together in a linear sequence.

[Lesson 5: Programming with Scrat](#)

In this skill-building lesson, students will continue to develop sequential algorithms.

[Lesson 6: Programming with Rey and BB-8](#)

In this skill-building lesson, students will use their newfound programming skills in more complicated ways to navigate a tricky course with BB-8.

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- Demonstrate Code and Go Robot Mouse prior to use.
- Demonstrate how to access age appropriate pre-selected online resources.
- Mini lessons may include: Demonstration/modeling of how to safely use tools such as Code and Go Robot Mouse, ipads, laptops, How to access appropriate online sites/applications such as Code.org, and Guided practice of online coding tutorials.
- Preview the essential questions and connect to learning throughout the unit.
- Refer to visual aids displayed in library media center.
- Utilize age appropriate coding tutorials.
- Vocabulary to introduce: program, algorithm, drag and drop, sequencing.
- Within the library media center have materials available for inquiry/ creative activities.

Materials

The materials used in this course allow for integration of a variety of instructional, enrichment, and intervention materials that support student learners at all levels in the school and home environments. Associated web content and media sources are infused into the unit as applicable and available.

Code.org and specific robots earmarked for each grade are core materials used by all library media specialists across district.

Suggested Supplemental Resources:

- <https://hourofcode.com/us/learn> (Hour of Code website)
- <https://code.org/educate/curriculum/elementary-school> (lesson plans)

- <https://www.scratchjr.org> (Scratch Jr application)
- Code-a-pillar App
- <https://www.learningresources.com/code-gor-robot-mouse-activity-set>
- [How to Use Your Code and Go Mouse Robot](#) (Youtube)

- Age appropriate online websites
- Age appropriate websites/applications
- Code and Go Robot Mouse
- Computer technology (Ipads/Tablets/Chromebooks)
- Interactive board technology (SmartPanel)
- Presentation software
- Visual aids

Suggested Strategies for Accommodations and Modifications

[Content specific accommodations and modifications as well as Career Ready Practices are listed here](#) for all students, including: Special Education, English Language Learners, At Risk of School Failure, Gifted and Talented, Students with 504.