# Unit 07: Coding

Content Area: **English Language Arts**
Course(s):
Time Period: **Trimester 3**
Length: **6-9 sessions**
Status: **Published**

## Brief Summary of Unit

Second 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: July 2026

## 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.

Information Literacy: This unit challenges students to locate, evaluate, and use information effectively. Information literacy includes, but is not limited to, digital, visual, media, textual, and technological literacy. Lessons may include the research process and how information is created and produced; critical thinking and using information resources; research methods, including the difference between primary and secondary sources; the difference between facts, points of view, and opinions, accessing peer-reviewed print and digital library resources; the economic, legal, social, and ethical issues surrounding the use of information.

Information Literacy for Elementary Educators

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| L.RF.2.3 | Know and apply grade-level phonics and word analysis skills in decoding words. |
| L.RF.2.4.A | Read grade-level text with purpose and understanding. |
| 9.4.2.TL.1 | Identify the basic features of a digital tool and explain the purpose of the tool (e.g., 8.2.2.ED.1). |
| 9.4.2.TL.4 | Navigate a virtual space to build context and describe the visual content. |
| 9.4.2.TL.7 | Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts (e.g., W.2.6., 8.2.2.ED.2). |
| L.KL.2.1 | Use knowledge of language and its conventions when writing, speaking, reading, or listening. |
| L.KL.2.1.A | Use words and phrases acquired through conversations, reading and being read to, and responding to texts. |
| LA.W.2.7 | Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). |
| LA.W.2.8 | Recall information from experiences or gather information from provided sources to answer a question. |
| LA.SL.2.1 | Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. |
| LA.SL.2.2 | Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. |
| RL.CR.2.1 | Ask and answer questions to demonstrate understanding of key details in a literary text, referring explicitly to the text as the basis for the answers. |
| LA.SL.2.6 | Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification. |
| RI.TS.2.4 | Describe the overall structure of a text and effectively use various text features (e.g., graphs, charts, images, captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information. |
| W.NW.2.3.C | Use transitional words to manage the sequence of events. |
| W.RW.2.7 | Engage in both collaborative and independent writing tasks regularly, including extended and shorter time frames. |
| SL.PE.2.1 | Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. |
| SL.PE.2.1.A | Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). |
| SL.PE.2.1.B | Build on others' talk in conversations by linking their explicit comments to the remarks of others. |
| SL.PE.2.1.C | Ask for clarification and further explanation as needed about the topics and texts under discussion. |
| SL.ES.2.3 | Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue. |
| SL.PI.2.4 | Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences. |
| SL.UM.2.5 | Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. |
| I | Inquire: Build new knowledge by inquiring, thinking critically, identifying problems, and developing strategies for solving problems. |
| I.A.1 | Formulating questions about a personal interest or a curricular topic. |

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| I.C | Learners adapt, communicate, and exchange learning products with others in a cycle that includes: |
| I.C.1 | Interacting with content presented by others. |
| I.C.2 | Providing constructive feedback. |
| I.C.3 | Acting on feedback to improve. |
| I.D | Learners participate in an ongoing inquiry-based process by: |
| I.D.1 | Continually seeking knowledge. |
| I.D.2 | Engaging in sustained inquiry. |
| I.D.3 | Enacting new understanding through real-world connections. |
| I.D.4 | Using reflection to guide informed decisions. |
| V | Explore: Discover and innovate in a growth mindset developed through experience and reflection. |
| V.A | Learners develop and satisfy personal curiosity by: |
| V.A.3 | Engaging in inquiry-based processes for personal growth. |
| V.B | Learners construct new knowledge by: |
| V.B.1 | Problem solving through cycles of design, implementation, and reflection. |
| V.B.2 | Persisting through self-directed pursuits by tinkering and making. |
| V.D | Learners develop through experience and reflection by: |
| V.D.1 | Iteratively responding to challenges. |
| V.D.3 | Open-mindedly accepting feedback for positive and constructive growth. |
| II.C.1 | Engaging in informed conversation and active debate. |
| II.C.2 | Contributing to discussions in which multiple viewpoints on a topic are expressed. |
| VI.D | Learners engage with information to extend personal learning by: |
| VI.D.1 | Personalizing their use of information and information technologies. |
| 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.CRP6 | Demonstrate creativity and innovation. |
| CRP.K-12.CRP6.1 | Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization. |
| CRP.K-12.CRP8 | Utilize critical thinking to make sense of problems and persevere in solving them. |
| CRP.K-12.CRP8.1 | Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They |

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| | carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others. |
| CRP.K-12.CRP9 | Model integrity, ethical leadership and effective management. |
| III | Collaborate: Work effectively with others to broaden perspectives and work toward common goals. |
| III.A.2 | Developing new understandings through engagement in a learning group. |
| III.A.3 | Deciding to solve problems informed by group interaction. |
| III.C | Learners work productively with others to solve problems by: |
| III.C.1 | Soliciting and responding to feedback from others. |
| III.C.2 | Involving diverse perspectives in their own inquiry processes. |
| III.D | Learners actively participate with others in learning situations by: |
| 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.A.CS1 | Understand and use technology systems. |
| TECH.8.1.2.A.CS2 | Select and use applications effectively and productively. |
| TECH.8.1.2.B | Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology. |
| TECH.8.1.2.B.CS2 | Create original works as a means of personal or group expression. |
| TECH.8.1.2.C | Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. |
| TECH.8.1.2.C.1 | Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media. |
| TECH.8.1.2.E.CS1 | Plan strategies to guide inquiry |
| 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.8.1.2.F.CS1 | Identify and define authentic problems and significant questions for investigation. |
| 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 | The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live. |
| TECH.8.2.2.A.CS2 | The core concepts of technology. |
| TECH.8.2.2.A.CS3 | The relationships among technologies and the connections between technology and other fields of study. |
| TECH.8.2.2.B.1 | Identify how technology impacts or improves life. |

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| TECH.8.2.2.B.4 | Identify how the ways people live and work has changed because of technology. |
| TECH.8.2.2.C | Design: The design process is a systematic approach to solving problems. |
| TECH.8.2.2.C.1 | Brainstorm ideas on how to solve a problem or build a product. |
| TECH.8.2.2.C.CS3 | The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving |
| 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.4 | Debug an algorithm (i.e., correct an error). |
| TECH.8.2.2.E.5 | Use appropriate terms in conversation (e.g., basic vocabulary words: input, output, the operating system, debug, and algorithm). |
| TECH.8.2.2.E.CS1 | Computational thinking and computer programming as tools used in design and engineering. |

## Essential Questions/Enduring Understandings

- How can I program a coding robot 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/Alternative: 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.

Second 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 incorporates code.org curriculum for second grade and various coding robots appropriate for grade level.

Code.org coding lessons should be completed in order following the progresson of Course A to Course F. Grade 2 should ideally focus on the lessons in Course B.

Course Lesson Plans can be found at the following link:
https://studio.code.org/teacher_dashboard/sections/6502663/courses/courseb-2025/units/1

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 B (2025) Overview:

We developed Course B with first graders in mind. While the concepts in Course B parallel those in Course A, students learn more sophisticated unplugged activities and work through a greater variety of puzzles. Students will learn the basics of programming, collaboration techniques, investigation and critical thinking skills, persistence in the face of difficulty, and internet safety. At the end of this course, students create games in the Play Lab programming environment.

Lesson 1: Digital Trails

Lesson 2: Move It, Move It

Lesson 3: Sequencing with Angry Birds

Lesson 4: Programming with Angry Birds

Lesson 5: Programming with Harvester

Lesson 6: Getting Loopy

Lesson 7: Loops with Harvester

Lesson 8: Loops with Laurel

Lesson 9: Drawing Garden with Loops

Lesson 10: The Right App

Lesson 11: The Big Event Jr.

Lesson 12: Mini-Porject: A Royal Battle with Events

Leson 13: End of Course Project

## Unplugged Coding Activity Bank

**Grades K–2**

- Human Robot – Students give step-by-step directions to guide a partner (the "robot") through a task or path, practicing algorithms and precise instructions.
- Algorithm Relay – Students sequence picture cards or steps to complete familiar tasks (e.g., brushing teeth, planting a seed) and discuss why order matters.
- Debug the Teacher – Students identify errors in intentionally incorrect instructions and explain how to fix the "bug."
- Simon Says Coding – Students use movement commands to create and follow simple programs using directional and action-based commands.
- Grid Coding Paths – Students use arrow cards or symbols to program a character through a grid while avoiding obstacles.
- Pattern Programming – Students identify and create repeating patterns using movements, sounds, colors, or objects to

explore the idea of loops.

- LEGO/Building Block Algorithms – Students create step-by-step building instructions that a partner follows to recreate a structure.
- Story Coding – Students sequence events from familiar stories and represent the steps as an algorithm.
- Coding with Beebots/Robots (No Screen) – Students plan and test movement sequences using programmable floor robots or manipulatives.
- Unplugged Sorting & Classification – Students organize objects or information by attributes to practice patterns and logical thinking.

- Demonstrate Dash and Dot robots 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 Dash and Dot robots, 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, looping.
- 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.

Please be sure to refer to the Cranford Public School's Acceptable Use of Generative AI Plan (2025-2026) for guidelines on elementary restriction on AI use. Linked here: https://docs.google.com/document/d/1fGZ8SlURzqXRV_NdjANqaw8vRpv4B9B8S-31McW_I1s/edit?tab=t.0

**Suggested Supplemental Resources**

**Select this link to view the second grade Google Folder under media in the Grades K-5 folder.**

**Websites and Applications:**

- Hour of Code (Please do not use Hour of AI)
- Elementary Code.org Lesson Plans
- Scratch Jr.
- Code-a-pillar App

- https://www.makewonder.com/ (Dash and Dot)

Robots Available:

- Code & Go Mouse
- How to Use Your Code and Go Mouse Robot (Youtube)
- Botley
- Dash
- Dot
- Edison
- Bee-Bot
- Ozobot
- Indi

Important Slide Decks (in Google Drive) to keep handy:

- Introduction to Dot (Google Slides)
- Introduction to Dash (Google Slides)
- How to Code a Sand Castle (Google Slides)
- Make a Recipe (Google Slides)
- Debugging (Google Slides)

- Age appropriate online websites
- Age appropriate websites/applications
- Computer technology (Ipads/Tablets/Chromebooks)
- Dash and Dot robots
- 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.