Curriculum Framework

C O D E

Code.org K–5 Curriculum Course 3

Lesson 1: Computational Thinking (unplugged)

Objectives	• Analyze information to draw conclusions. • Match identical portions of similar phrases to match patterns. • Identify differences in similar phrases and abstract them out.
Themes	Algorithms
Practices	Problem Solving

Standards	ISTE: 1.b, 1.c, 2.d, 4.b, 4.d
	CSTA: CPP.L1:6-5, CT.L1:6-02, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12, CT.L2-14
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 3, 6, 7, 8
	CC ELA: SL.3.1, SL.3.3, L.3.6
	    SL.4.6
	    SL.5.1, SL.5.6

Lesson 2: Maze

Objectives	• Create a program for a given task using sequential steps. • Count the number of times an action should be repeated and represent it as a loop. • Analyze a problem and complete it as efficiently as possible. • Employ a combination of sequential and looped commands to reach the end of a maze.
Themes	Computing Practice and Programming
Practices	Problem Solving

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 3: Artist

Objectives	• Count the number of times an action should be repeated and represent it as a loop. • Divide the number of degrees in a circle into even segments. • Calculate the angles in equilateral and 30 60 90 triangles.

	• Given a perimeter and one side of a rectangle, calculate the remaining sides. • Identify symmetrical shapes. • Decompose a shape into its smallest repeatable sequence.
Themes	Computing Practice and Programming
Practices	Problem Solving, Creativity

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3, 3.G.A.2
	    4.NBT.B.4, 4.MD.A.3, 4.MD.C.5, 4.MD.C.7, 4.G.A.1, 4.G.A.2, 4.G.A.3
	    5.NBT.B.5, 5.G.A.2
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 4: Functional Suncatchers (unplugged)

Objectives	• Learn to find patterns in processes • Think about an artistic task in a different way • Interpret symbols as they relate to physical manipulatives
Themes	Algorithms
Practices	Problem Solving

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CPP.L1:6-05, CT.L2-01, CT.L2-06, CT.L2-07, CT.L2-08, CT.L2-12, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 5, 6, 7, 8
	CC ELA: SL.3.1, SL.3.3, L.3.6
	    SL.4.6
	    SL.5.1, SL.5.6

Lesson 5: Artist - Functions

Objectives	• Use a pre-determined function to draw an image with repeated features. • Modify an existing function to draw a different shape. • Distinguish between functions and loops. • Create a program that calls a function from within a loop.
Themes	Computing Practice and Programming
Practices	Creativity, Problem Solving

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3, 3.G.A.2
	    4.NBT.B.4, 4.MD.A.3, 4.MD.C.5, 4.MD.C.7, 4.G.A.1, 4.G.A.2, 4.G.A.3
	    5.NBT.B.5, 5.G.A.2
	ELA: L.3.6

	L.4.6
	L.5.6

Lesson 6: Bee - Functions

Objectives	• Define functions for commonly repeated tasks. • Use student-defined functions in programs. • Modify an existing function to complete a different task. • Create a function from scratch.
Themes	Computing Practice and Programming
Practices	Problem Solving

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 7: Bee - Conditionals

Objectives	• Compare properties and values using >, =, < symbols. • Translate spoken language conditional statements into a program. • Execute an algorithm with a conditional statement. • Use conditional statements to make logic-based choices. • Nest conditionals to analyze multiple value conditions using if, else if, else logic. • Write functions that execute nested conditionals.
Themes	Computing Practice and Programming
Practices	Problem Solving

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 8: Maze - Conditionals

Objectives	• Compare properties and values using >, =, < symbols. • Translate spoken language conditional statements into a program. • Execute an algorithm with a conditional statement. • Use conditional statements to make logic-based choices.

	• Nest conditionals to analyze multiple value conditions using if, else if, else logic. • Write functions that execute nested conditionals.
Themes	Computing Practice and Programming
Practices	Problem Solving
Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03 NGSS: 3-5-ETS1-2 CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8 CC Math Standards: 3.OA.3 　　4.NBT.B.4 　　5.NBT.B.5CC ELA: L.3.6 　　L.4.6 　　L.5.6

Lesson 9: Songwriting (unplugged)

Objectives	• Locate repeating phrases inside song lyrics. • Identify sections of a song to pull into a function (chorus). • Describe how functions can make programs easier to write.
Themes	Abstraction
Practices	Creativity
Standards	ISTE: 1.b, 1.c, 2.d, 4.b, 4.d CSTA: CPP.L1:6-5, CT.L1:6-02, CT.L2-01, CT.L2-06, CT.L2-07, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03, CT.L2-14 NGSS: 3-5-ETS1-2 CC Mathematical Practices: 1, 2, 5, 6, 7, 8 CC ELA: SL.3.1, SL.3.3, L.3.6 　　SL.4.6 　　SL.5.1, SL.5.6

Lesson 10: Dice Race (unplugged)

Objectives	• Name various activities that make up their day. • Decompose large activities into a series of smaller events. • Arrange sequential events into their logical order.
Themes	Algorithms
Practices	Problem Solving
Standards	ISTE: 1.a, 1.c, 2.d, 4.b, 4.d, 6.a CSTA: CD1:6-06, CPP.L1:6-05, CT.L1:6-02, CT.L2-01CT.L2-12, CT.L2-14, CT.L3A-03 NGSS: 3-5-ETS1-2 CC Mathematical Practices: 1, 2, 4, 6, 7, 8 CC Math Standards: 4.NBT.B.4 CC ELA: SL.3.1, SL.3.3, L.3.6 　　SL.4.6 　　SL.5.1, SL.5.6

Lesson 11: Artist - Nested Loops

Objectives	• Count the number of times an action should be repeated and represent it as a loop. • Divide the number of degrees in a circle into even segments. • Given a number of segments, calculate the degrees need to complete a circle. • Break complex tasks into smaller repeatable sections. • Combine simple shapes into complex designs with nested loops.
Themes	Computing Practice and Programming
Practices	Problem Solving, Creativity

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-07, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3, 3.G.A.2
	    4.NBT.B.4, 4.MD.A.3, 4.MD.C.5, 4.MD.C.7, 4.G.A.1, 4.G.A.2, 4.G.A.3
	    5.NBT.B.5, 5.G.A.2
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 12: Farmer - While Loops

Objectives	• Distinguish between loops that repeat a fixed number of times and loops that repeat until a condition is met. • Use a while loop to create programs that can solve problems with unknown values.
Themes	Computing Practice and Programming
Practices	Problem Solving

Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-07, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 13: Bee – Nested Loops

Objectives	• Break a sequence of steps into a hierarchy or looped sequences. • Nest loops and conditionals to analyze multiple value conditions using if, else if, else logic.
Themes	Computing Practice and Programming
Practices	Problem Solving
Standards	ISTE: 1.a, 1.c, 4.b, 6.a, 6.c, 6.d

	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-07, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 14: Bee Debugging

Objectives	• Predict where a program will fail. • Modify an existing program to solve errors. • Identify an algorithm that is unsuccessful when the steps are out of order. • Analyze complex conditionals for errors in logical. • Rearrange incorrectly nested loops. • Distinguish between a function definition and function call. • Reflect on the debugging process in an age-appropriate way.
Themes	Computing Practice and Programming
Practices	Persistence, Problem Solving

Standards	ISTE: 1.a, 1.c, 4.b, 4.d, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	ELA: L.3.6
	    L.4.6
	    L.5.6

Lesson 15: Bounce

Objectives	• Match blocks with the appropriate event handler. • Create a game using event handlers. • Share a creative artifact with other students.
Themes	Computing Practice and Programming
Practices	Persistence

Standards	ISTE: 1.a, 1.c, 4.b, 4.d, 6.a, 6.c, 6.d
	CSTA: CT.L1:3-01, CL.L1:3-02, CT.L1:6-01, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-06, CT.L2-08, CT.L2-12, CT.L2-14, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	ELA: L.3.6

	L.4.6
	L.5.6

Lesson 16: Play Lab – Create a Story

Objectives	• Identify actions that correlate to input events. • Create an animated, interactive story using sequence, loops, and event-handlers. • Share a creative artifact with other students.
Themes	Computing Practice and Programming
Practices	Creativity

Standards	ISTE: 1.a, 1.b, 1.c, 2.a, 2.b, 4.b, 4.d, 6.a, 6.c, 6.d
	CSTA: CL.L1:3-02, CT.L1:3-01, CT.L1:3-02, CT.L1:6-01, CPP.L1:3-03, CPP.L1:6-03, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-0, CT.L2-08, CT.L2-12, CT.L2-14, CPP.L2-08, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	CC ELA: SL.3.1, SL.3.3, L.3.6
	    SL.4.6
	    SL.5.1, SL.5.6

Lesson 17: Play Lab – Create a Game

Objectives	• Identify actions that correlate to input events. • Create an animated, interactive game using sequence, loops, and event-handlers. • Share a creative artifact with other students.
Themes	Computing Practice and Programming
Practices	Creativity

Standards	ISTE: 1.a, 1.b, 1.c, 2.a, 2.b, 4.b, 4.d, 6.a, 6.c, 6.d
	CSTA: CL.L1:3-02, CT.L1:3-01, CT.L1:3-02, CT.L1:6-01, CPP.L1:3-03, CPP.L1:6-03, CPP.L1:6-05, CPP.L1:6-06, CT.L2-01, CT.L2-0, CT.L2-08, CT.L2-12, CT.L2-14, CPP.L2-08, CT.L3A-03
	NGSS: 3-5-ETS1-2
	CC Mathematical Practices: 1, 2, 4, 5, 6, 7, 8
	CC Math Standards: 3.OA.3
	    4.NBT.B.4
	    5.NBT.B.5CC
	CC ELA: SL.3.1, SL.3.3, L.3.6
	    SL.4.6
	    SL.5.1, SL.5.6

Lesson 18: Internet (unplugged)

Objectives	• Learn about the complexity of sending messages over the Internet. • Translate URLs into IP Addresses. • Practice creative problem solving.
Themes	Data
Practices	Communicating

Standards	ISTE: 5.a, 5.b, 6.a CSTA: CI.L1:3-01, CPP.L2-06, CD.L1:6-04, CD.L2-06 CC ELA: SL.3.1, SL.3.3, L.3.6 　　　SL.4.6 　　　SL.5.1, SL.5.6

Lesson 19: Crowdsourcing (unplugged)

Objectives	• Identify a large task that needs to be done. • Rearrange a large task into several smaller tasks. • Build a complete solution from several smaller solutions.
Themes	Abstraction
Practices	Collaboration
Standards	ISTE: 1.c, 2.d, 4.b, 6.a CSTA: CPP.L1:3-04, CT.L1:3-03, CT.L1:6-01, CT.L1:6-02, CT.L1:6-05, CL.L1:6-03, CT.L2-06 NGSS: 3-5-ETS1-2 CC Mathematical Practices: 1, 2, 6, 7, 8 CC ELA: SL.3.1, SL.3.3, L.3.6 　　　SL.4.6 　　　SL.5.1, SL.5.6

Lesson 20: Digital Citizenship (unplugged)

Objectives	• Compare and contrast their responsibilities to their online and offline communities. • Understand what type of information can put them at risk for identity theft and other scams. • Reflect on the characteristics that make someone an upstanding citizen. • Devise resolutions to digital dilemmas.
Themes	Community Global and Ethical Impacts
Practices	Communicating
Standards	ISTE: 1.c, 2.d, 5.a, 5.b, 5.d, 6.a CSTA: CI.L1:3-01, CI.L1:6-01, CI.L1:6-02, CI.L1:6-04, CI.L2-01, CI.L2-05, CPP.L2-06 CC ELA: SL.3.1, SL.3.3, L.3.6 　　　SL.4.6 　　　SL.5.1, SL.5.6