

# Space Cadet

# Grades K-2

## Scope and Sequence

Each lesson takes about one class period to complete.

Space Cadet is a course for students in grade K-2 who are new to Tynker. It is available for free on iPads as part of the [Everyone Can Code program](#) from Apple. You can download a free [teacher guide iBook](#) from Apple. The stories, games, puzzles, and projects in this course engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Crash Landed!	Lesson 2 - Dance Party	Lesson 3 - Stay the Course	Lesson 4 - Walk. Jump. Repeat.	Lesson 5 - Glitchy Code	Lesson 6 - Asteroids	Lesson 7 - Shifty Aliens	Lesson 8 - Blast Off!
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Sequence blocks of code to create algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Create your own sequence</li> <li>Understand the importance of order in sequencing</li> </ul>	<ul style="list-style-type: none"> <li>Construct sequences in different ways</li> <li>Understand there's more than one way to solve a problem</li> </ul>	<ul style="list-style-type: none"> <li>Code with loops</li> <li>Detect patterns in code sequences</li> <li>Identify when to use loops for efficiency</li> </ul>	<ul style="list-style-type: none"> <li>Troubleshoot and debug a program</li> </ul>	<ul style="list-style-type: none"> <li>Trigger code using different events</li> <li>Broadcast and receive messages</li> </ul>	<ul style="list-style-type: none"> <li>Run code only when a condition is true</li> <li>Construct dynamic programs that respond to changing conditions</li> </ul>	<ul style="list-style-type: none"> <li>Construct an algorithm to solve a problem</li> <li>Design a simple program</li> </ul>
CCSS-Math Standards	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	MP.1 5.G.1 5.G.2 6.NS.6	MP.1 5.G.1 5.G.2 6.NS.5 6.NS.6	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4
CCSS-ELA Standards	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.W.3, 4.W.3 3.W.4, 4.W.4 3.W.6, 4.W.6 3.L.1, 4.L.1, 3.L.2, 4.L.2 3.L.3, 4.L.3, 3.L.4, 4.L.4 3.RI.3, 4.RI.3, 3.RI.5 3.RI.7, 4.RI.7, 3.RF.3, 4.RF.3, 3.RF.4, 4.RF.4	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6
CSTA Computer Science Standards	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10 1A-AP-11	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10 1A-AP-11 1A-AP-14	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d
UK National Curriculum	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*
Sample Application of Skills	Use sequencing to solve puzzles.	Use sequencing to solve puzzles.	Use custom and unique sequencing to solve puzzles.	Demonstrate understanding of sequencing and loops.	Fix the broken code to solve the puzzles.	Create interactive games using broadcasting and receiving messages between actors.	Use conditional statements and logic to solve puzzles.	Use conditional statements and loops to solve puzzles

# Dragon Spells

# Grades 3-5

## Scope and Sequence

Each lesson takes about one class period to complete.

Dragon Spells is a course for students in grade 3-5 who are new to programming. It is available for free on iPads as part of the [Everyone Can Code program](#) from Apple. You can download a free [teacher guide iBook](#) from Apple. The stories, games, puzzles, and projects in this course engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Dragon Eggs	Lesson 2 - Blast Through	Lesson 3 - Deja Vu	Lesson 4 - Twisted Trees	Lesson 5 - Dragon Scrolls	Lesson 6 - Ancient Spells	Lesson 7 - Catch Me If You Can	Lesson 8 - The Long Road
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Build a set of commands, forming an algorithm</li> <li>Sequence commands in a specific order to solve a problem</li> </ul>	<ul style="list-style-type: none"> <li>Analyze algorithms to find errors</li> <li>Troubleshoot and debug a program</li> </ul>	<ul style="list-style-type: none"> <li>Detect patterns in code sequences</li> <li>Build more efficient algorithms using loops</li> </ul>	<ul style="list-style-type: none"> <li>Deconstruct problems into manageable parts</li> <li>Assemble parts of a program to solve a larger problem</li> <li>Recognize patterns for decomposition</li> </ul>	<ul style="list-style-type: none"> <li>Group common elements together to create efficient processes in solving problems</li> </ul>	<ul style="list-style-type: none"> <li>Create functions to shorten code</li> <li>Call a function to trigger a set of code</li> </ul>	<ul style="list-style-type: none"> <li>Run code when a condition is true</li> <li>Construct dynamic programs that can respond to changing conditions</li> </ul>	<ul style="list-style-type: none"> <li>Repeatedly run a series of commands based on whether certain conditions are true</li> <li>Build programs with loops inside other loops</li> </ul>
CCSS-Math Standards	MP.1	MP.1 5.G.1 5.G.2 6.NS.6	MP.1 1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	MP.1 1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	MP.1	MP.1 1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	MP.1	MP.1
CCSS-ELA Standards	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	1.RI.3, 2.RI.3 1.RI.6, 2RI.6 1.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2RI.6 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2RI.6 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2RI.6 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6	3.W.3, 4.W.3 3.W.4, 4.W.4 3.W.6, 4.W.6 3.L.1, 4.L.1, 3.L.2, 4.L.2 3.L.3, 4.L.3, 3.L.4, 4.L.4 3.RI.3, 4.RI.3, 3.RI.5 3.RI.7, 4.RI.7, 3.RF.3, 4.RF.3, 3.RF.4, 4.RF.4	1.RI.3, 2.RI.3 1.RI.6, 2RI.6 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6
CSTA Computer Science Standards	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10 1A-AP-11	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10 1A-AP-11 1A-AP-14	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d
UK National Curriculum	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*
Sample Application of Skills	Use sequencing to solve puzzles.	Fix the broken code to solve the puzzles.	Demonstrate understanding of sequencing and loops.	Use simple loops and custom sequencing to solve puzzles.	Use loops and sequencing .	Create a Mad Libs-style game.	Use conditional statements to solve the puzzles.	Use conditional statements and loops to solve the puzzles.

# Dragon Spells

# Grades 3-5

## Scope and Sequence

Each lesson takes about one class period to complete.

Dragon Spells is a course for students in grade 3-5 who are new to programming. It is available for free on iPads as part of the [Everyone Can Code program](#) from Apple. You can download a free [teacher guide iBook](#) from Apple. The stories, games, puzzles, and projects in this course engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Gem Collector	Lesson 10 - Dragon Maker						
<b>Key Skills and Concepts</b>	<ul style="list-style-type: none"> <li>• Create a program that tracks a value that can change over time</li> <li>• Build programs that take input and give output</li> </ul>	<ul style="list-style-type: none"> <li>• Craft and modify the visual elements of an app (UI)</li> <li>• Change the experience that a user has on an app (UX)</li> <li>• Customize UI and UX</li> </ul>						
<b>CCSS-Math Standards</b>	MP.1 MP.2 MP.4	MP.1						
<b>CCSS-ELA Standards</b>	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	1.RI.3, 2.RI.3 1.RI.6, 2RI.6 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3 2.L.6						
<b>CSTA Computer Science Standards</b>	1A-AP-08 1A-AP-10	1A-AP-08 1A-AP-10						
<b>ISTE Standards</b>	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d						
<b>UK National Curriculum</b>	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*						
<b>Sample Application of Skills</b>	Create and modify variables to solve puzzles.	Customize a dragon using intuitive UI buttons.						

# Programming 1A

# Grades 1-2

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 1A is a course for students in grade 1 or 2 who are new to Tynker. The puzzles and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Welcome	Lesson 2 - Connect Code Blocks	Lesson 3 - Recognize the Pattern	Lesson 4 - Follow the Path	Lesson 5 - Sequencing	Lesson 6 - Conditional Logic	Lesson 7 - Conditional Loops	Lesson 8 - Draw Simple Shapes	
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Learn about Tynker and what you can build with code</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events</li> <li>Use simple loops</li> </ul>	<ul style="list-style-type: none"> <li>Use conditional loops</li> <li>Create custom sequences to solve puzzles</li> <li>Recognize patterns to create algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Sequence blocks of code to create algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events</li> <li>Use simple loops</li> <li>Use repetition to create algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Recognize patterns</li> <li>Use conditional loops</li> <li>Sequence blocks of code</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events</li> <li>Recognize patterns</li> <li>Use conditional loops</li> <li>Sequence blocks of code</li> </ul>	<ul style="list-style-type: none"> <li>Sequence blocks of code</li> <li>Draw geometric shapes and angles using repetition and loops</li> </ul>	
CCSS-Math Standards		1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3, 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4 1.GA.1, 2.GA.1 1.GA.2, 2.GA.2	
CCSS-ELA Standards	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3, 1.RI.6, 2RI.6, 1.RI.7, 2RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6
CSTA Computer Science Standards	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-08 1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15 1A-DA-06 1A-DA-07	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	
UK National Curriculum	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	
Sample Application of Skills	Understand how to use visual blocks to program algorithms to solve puzzles.	Demonstrate understanding of sequencing and loops.	Use sequencing and repetition to solve puzzles.	Use sequencing and conditional loops to solve puzzles.	Use sequencing and repetition to solve puzzles.	Use sequencing, conditional logic, conditional loops, and repetition to solve puzzles.	Use sequencing, conditional loops, and repetition to solve puzzles.	Draw simple shapes and angles using sequencing, repetition, and loops.	

# Programming 1A

# Grades 1-2

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 1A is a course for students in grade 1 or 2 who are new to Tynker. The puzzles and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Squares, Triangles, and Staircases	Lesson 10 - Sequencing Review	Lesson 11 - Use Repeat Loops	Lesson 12 - Complete Multiple Tasks in Order				
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use simple loops</li> <li>Use simple events</li> <li>Draw geometric shapes with repetition and loops</li> </ul>	<ul style="list-style-type: none"> <li>Use sequencing concepts</li> <li>Use simple loops</li> <li>Recognize patterns</li> </ul>	<ul style="list-style-type: none"> <li>Use simple loops</li> <li>Sequence code blocks to program algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Use functions to handle sub-tasks</li> <li>Call functions</li> <li>Use conditional loops</li> </ul>				
CCSS-Math Standards	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4 1.GA.1, 2.GA.1 1.GA.2, 2.GA.2	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4				
CCSS-ELA Standards	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6				
CSTA Computer Science Standards	1A-AP-10 1A-AP-11 1A-AP-14 1A-AP-12 1A-AP-15	1A-AP-08 1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15	1A-AP-10 1A-AP-11 1A-AP-12 1A-AP-15 1B-AP-16				
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d				
UK National Curriculum	Coming Soon	Coming Soon	Coming Soon	Coming Soon				
Sample Application of Skills	Draw various shapes using sequencing, repetition and loops.	Use sequencing and repetition to solve puzzles.	Use sequencing, repetition, and loops to solve puzzles.	Use functions, sequencing, and loops to solve puzzles.				

# Programming 1B

# Grades 1-2

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 1B is a course for students in grade 1 or 2 who are new to Tynker. The puzzles and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Welcome	Lesson 2 - Use Conditional Logic	Lesson 3 – Apply Advanced Logic	Lesson 4 - Animation and Sound	Lesson 5 - Apply Negative Logic	Lesson 6 - Use Nested Logic	Lesson 7 - Use Advanced Logic	Lesson 8 - Write a Story	
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Learn about Tynker and what you can build with code</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events</li> <li>Use simple loops</li> <li>Use negative logic</li> </ul>	<ul style="list-style-type: none"> <li>Use conditional loops</li> <li>Create custom sequences to solve puzzles</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events</li> <li>Animate Actors using sounds and events</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events</li> <li>Use simple loops</li> <li>Use repetition to create algorithms</li> <li>Use negative logic</li> </ul>	<ul style="list-style-type: none"> <li>Recognize patterns</li> <li>Use conditional loops</li> <li>Use nested logic</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events</li> <li>Recognize patterns</li> <li>Use conditional loops</li> <li>Sequence blocks of code</li> </ul>	<ul style="list-style-type: none"> <li>Sequence blocks of code</li> <li>Animate Actors using sounds, dialogue, and events</li> </ul>	
CCSS-Math Standards	-	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.MD.4	
CCSS-ELA Standards	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6
CSTA Computer Science Standards	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	
UK National Curriculum	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	
Sample Application of Skills	Understand how to use visual blocks to program algorithms to solve puzzles.	Use repetitive sequencing and conditional logic to solve puzzles.	Use conditional logic and loops to solve puzzles.	Create an animation of an Actor interacting with their surroundings.	Use sequencing and repetition to solve puzzles.	Use sequencing, conditional logic, conditional loops, and repetition to solve puzzles.	Use sequencing, conditional loops, and repetition to solve puzzles.	Create an animation of an Actor interacting with their surroundings.	

# Programming 1B

# Grades 1-2

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 1B is a course for students in grade 1 or 2 who are new to Tynker. The puzzles and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Make Geometric Patterns	Lesson 10 - Use Arrow Keys to Move	Lesson 11 - Build a Game	Lesson 12 - Sequencing Review	Lesson 13 - Loops Review	Lesson 14 - Patterns Review			
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Sequence blocks of code</li> <li>Draw geometric shapes using repetition and loops</li> </ul>	<ul style="list-style-type: none"> <li>Use sequencing concepts</li> <li>Animate Actors using motion, sound, and events</li> </ul>	<ul style="list-style-type: none"> <li>Use simple events and loops</li> <li>Animate Actors using motion, sound, and events</li> </ul>	<ul style="list-style-type: none"> <li>Use sequencing concepts</li> <li>Use simple loops</li> <li>Recognize patterns</li> </ul>	<ul style="list-style-type: none"> <li>Use simple loops</li> <li>Sequence code blocks to program algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Recognize patterns</li> <li>Sequence code blocks to program algorithms</li> </ul>			
CCSS-Math Standards	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4 1.GA.1, 2.GA.1 1.GA.2, 2.GA.2	1.MD.4	1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4	1.OA.1, 2.OA.1 1.OA.2, 2.OA.2 1.OA.3, 2.OA.3 1.MD.4			
CCSS-ELA Standards	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6	1.RI.3, 2.RI.3 1.RI.6, 2.RI.6 1.RI.7, 2.RI.7 1.RI.10, 2.RI.10 1.RF.1, 2.RF.1 1.RF.4, 2.RF.4 1.L.3, 2.L.3, 2.L.6		
CSTA Computer Science Standards	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15			
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d			
UK National Curriculum	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon	Coming Soon			
Sample Application of Skills	Draw various shapes using sequencing, repetition and loops.	Create an animation of a rocket moving through outer space.	Create a game with moving Actors interacting with one another.	Use sequencing and repetition to solve puzzles.	Use sequencing, repetition, and loops to solve puzzles.	Use sequencing, repetition, patterns, and loops to solve puzzles.			

# Programming 101

# Grades 3-4

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 101 is a course for students in grade 3 or 4 who are new to Tynker. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Introduction	Lesson 2 - Tynker Workshop	Lesson 3 - Animation	Lesson 4 - Storytelling	Lesson 5 - Input Events	Lesson 6 - Slideshow	Lesson 7 - Character Creator	Lesson 8 - Make a Birthday Card
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use visual code blocks to create a program</li> <li>Sequence steps</li> <li>Use loops for repetition</li> <li>Use conditional statements and branching logic</li> </ul>	<ul style="list-style-type: none"> <li>Use Actors, sounds, and scenes from the Media Library</li> <li>Use simple loops</li> <li>Use delays</li> </ul>	<ul style="list-style-type: none"> <li>Animate Actors with simple costume handling</li> </ul>	<ul style="list-style-type: none"> <li>Use speech bubbles to make Actors have a conversation</li> <li>Use different kinds of speech bubbles and delays to convey meaning and emotion</li> </ul>	<ul style="list-style-type: none"> <li>Use keyboard controls to turn, point, and move Actors</li> </ul>	<ul style="list-style-type: none"> <li>Create slideshow presentations in Tynker</li> </ul>	<ul style="list-style-type: none"> <li>Build and customize an animated character</li> <li>Set character parts and use advanced animation</li> </ul>	<ul style="list-style-type: none"> <li>Make Actors appear and disappear</li> <li>Apply special graphics effects</li> </ul>
CCSS-Math Standards	-	-	-	-	4.MD.5	-	4.NF.C.7	-
CCSS-ELA Standards	-	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3, 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3, 3.RI.5 3.RI.7, 4.RI.7, 3.RF.3, 4.RF.3, 3.RF.4, 4.RF.4 3.W.3, 4.W.3, 3.W.4, 4.W.4, 3.L.1, 4.L.1 3.L.2, 4.L.2, 3.L.3, 4.L.3 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4
CSTA Computer Science Standards	1B-AP-08 1B-AP-10 1B-AP-12 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d
UK National Curriculum	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*
Sample Application of Skills	Create a program using simple conditionals and loops to move an Actor through an obstacle course.	Create a scene and an Actor and sounds to accompany them.	Create an animation of a bird flying across the screen.	Create a comic-book style conversation between Actors and have them tell jokes and stories.	Create unique controls to guide a robot through a maze, or a car through city streets.	Create a slideshow presentation with pictures and captions.	Create an Epic Quest game, with a Hero that can animate to obtain a reward and avoid an enemy.	Create a birthday card featuring Actors that appear and disappear, and special graphic effects.



# Programming 101

# Grades 3-4

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 101 is a course for students in grade 3 or 4 who are new to Tynker. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - The Music Machine	Lesson 10 - Positioning Actors	Lesson 11 - Pen Drawing	Lesson 12 - Keeping Score	Lesson 13 - Adding Logic	Lesson 14 - Quiz Game	Lesson 15 - Color Sensing		
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Generate music using musical notes, various instruments, and changing tempos</li> </ul>	<ul style="list-style-type: none"> <li>Move Actors to specific screen locations using x- and v-values</li> <li>Move Actors left/right using changes in x-values, and up/down using changes in y-values</li> </ul>	<ul style="list-style-type: none"> <li>Make Actors draw using the Pen commands</li> <li>Make multiple copies of Actors</li> </ul>	<ul style="list-style-type: none"> <li>Use a special TynkerBlock to keep track of score</li> <li>Generate a random number from a range of numbers</li> <li>Make Actors respond to messages they receive</li> </ul>	<ul style="list-style-type: none"> <li>Use conditional statements and comparison operators</li> </ul>	<ul style="list-style-type: none"> <li>Use more advanced conditional statements and branching logic</li> </ul>	<ul style="list-style-type: none"> <li>Make Actors respond to touching certain colors</li> </ul>		
CCSS-Math Standards	-	5.G.1, 5.G.2 6.NS.5, 6.NS.6	-	5.G.1, 5.G.2 6.NS.5, 6.NS.6	2.NBT.4 5.G.1, 5.G.2 6.NS.5, 6.NS.6	-	2.NBT.4 5.G.1, 5.G.2, 6.NS.5 6.NS.6 (not all these)		
CCSS-ELA Standards	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.W.3, 4.W.3, 3.W.4, 4.W.4, 3.W.6, 4.W.6 3.L.1, 4.L.1, 3.L.2, 4.L.2 3.L.3, 4.L.3, 3.L.4, 4.L.4 3.RI.3, 4.RI.3, 3.RI.5 3.RI.7, 4.RI.7, 3.RF.3, 4.RF.3, 3.RF.4, 4.RF.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	
CSTA Computer Science Standards	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-12 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15		
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d		
UK National Curriculum	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*		
Sample Application of Skills	Create a piano and a drum machine.	Create a game with falling Actors that need to be caught.	Create an Etch-a-Sketch© style drawing machine.	Create a game where Actors appear and disappear in random places, and score is kept.	Create an Actor who makes different comments and changes costumes depending on the scene.	Develop an interactive story where the user provides input on which path the story will take.	Create a game where Actors need to navigate through a maze and avoid enemies.		

# Programming 102

# Grades 3-4

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 102 is a course for students in grade 3 or 4 who have completed Tynker's Programming 101 course. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Review: Interactive Animation	Lesson 2 - Review: Pen Drawing	Lesson 3 - Review: Ghost-Catcher	Lesson 4 - Review: Character Creator	Lesson 5 - Show and Hide	Lesson 6 - Layers	Lesson 7 - Motion	Lesson 8 - Snowball Siege
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Review how to add Actors, add Costumes, animate, move, handle key-press events, use loops for repetition, use delays, and play sounds</li> </ul>	<ul style="list-style-type: none"> <li>Review messaging techniques and usage of the Pen drawing tools</li> </ul>	<ul style="list-style-type: none"> <li>Review detection of color and touch</li> <li>Review making Actors appear and disappear</li> </ul>	<ul style="list-style-type: none"> <li>Review basic and advanced animation methods</li> <li>Review usage of conditional statements</li> </ul>	<ul style="list-style-type: none"> <li>Review moving Actors to random screen locations using random number generators</li> </ul>	<ul style="list-style-type: none"> <li>Layer Actors in front of or behind each other on the Stage</li> </ul>	<ul style="list-style-type: none"> <li>Make an Actor follow the cursor around the stage</li> <li>Use math operators in conditional statements</li> </ul>	<ul style="list-style-type: none"> <li>Glide smoothly to a specific location</li> <li>Control script flow</li> <li>Broadcast and receive messages</li> </ul>
CCSS-Math Standards	MP.1 5.G.1 5.G.2 6.NS.5 6.NS.6	MP.1	MP.1	MP.1	MP.1 5.G.1 5.G.2 6.NS.5 6.NS.6	MP.1	MP.1 2.OA.1 5.G.1 5.G.2 6.NS.5 6.NS.6	MP.1 5.G.1 5.G.2 6.NS.5 6.NS.6
CCSS-ELA Standards	-	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4
CSTA Computer Science Standards	1B-AP-10 1B-AP-15	1B-AP-10 1B-AP-15	1B-AP-10 1B-AP-15	1B-AP-10 1B-AP-15	1B-AP-10 1B-AP-15	1B-AP-10 1B-AP-15	1B-AP-10 1B-AP-15	1B-AP-10 1B-AP-15
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d
UK National Curriculum	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*
Sample Application of Skills	Create an underwater adventure game involving animating and moving fish, collecting treasure, and avoiding enemies.	Create a painting program that lets the user change the colors, shades, and sizes of the brush strokes.	Create a ghost-catcher game where ghosts respond to touching certain colors.	Create an adventure game where a Hero must animate to earn power-ups while avoiding enemies.	Create a Whack-a-Mole style of game where Actors appear in random locations quickly.	Build a "Where's Waldo?" style game with multiple Actors overlapping and hiding.	Create an obstacle course game.	Create a snowball fight game, with different Actors hiding, appearing, and disappearing when hit.

# Programming 102

# Grades 3-4

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 102 is a course for students in grade 3 or 4 who have completed Tynker's Programming 101 course. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Drawing Patterns	Lesson 10 - Color Effects	Lesson 11 - Stamping	Lesson 12 - Star Runner	Lesson 13 - Space Breaker	Lesson 14 - 2-Player Battle	Lesson 15 - Sky Train	Lesson 16 - Final Lesson	
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use keyboard controls to point and turn Actors, and have them use various drawing effects.</li> </ul>	<ul style="list-style-type: none"> <li>Apply a variety of graphic effects to Actors.</li> <li>Use functions to reuse groups of code blocks.</li> </ul>	<ul style="list-style-type: none"> <li>Make multiple copies of Actors</li> <li>Change sizes of Actors by a percentage</li> <li>Draw text on the screen</li> </ul>	<ul style="list-style-type: none"> <li>Draw lines on the screen using a new method</li> </ul>	<ul style="list-style-type: none"> <li>Make a simple timer to control a game, and reset timer</li> </ul>	<ul style="list-style-type: none"> <li>Use nested loops</li> <li>Use conditional loops</li> <li>Use "or" in a conditional statement</li> </ul>	<ul style="list-style-type: none"> <li>Use advanced motion techniques</li> <li>Call functions</li> <li>Use more math operators</li> </ul>	<ul style="list-style-type: none"> <li>Open-ended projects</li> </ul>	
CCSS-Math Standards	MP.1 4.MD.5	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1	
CCSS-ELA Standards	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.RI.3, 4.RI.3 3.RI.5 3.RI.7, 4.RI.7 3.RF.3, 4.RF.3 3.RF.4, 4.RF.4 3.L.4, 4.L.4	3.W.3, 4.W.3, 3.W.4, 4.W.4, 3.W.6, 4.W.6 3.L.1, 4.L.1, 3.L.2, 4.L.2, 3.L.3, 4.L.3, 3.L.4, 4.L.4, 3.RI.3, 4.RI.3, 3.RI.5, 3.RI.7, 4.RI.7, 3.RF.3, 4.RF.3, 3.RF.4, 4.RF.4
CSTA Computer Science Standards	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	
UK National Curriculum	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	Keystages 1 & 2 Computing*	
Sample Application of Skills	Create interesting circular patterns among the stars by making starships turn and change colors.	Create a constellation maker that draws lines between draggable stars and uses several graphic effects.	Fill a scene with multiple copies of Actors with different costumes.	Create a game where a starship can shoot lasers at stars and enemy ships.	Build a Space Breaker game with a ball, paddles, and bricks.	Develop a battle game with lasers, Actors, scenes, and music.	Create a Sky Rider with train cars that follow along one after the other, and collect treasures.	5 open-ended projects allow students to use their creativity and apply all the concepts they've learned.	

# Programming 201

# Grades 5-6

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 201 is a course for students in grade 5 or 6 who are new to Tynker. The stories, games, puzzle and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Introduction	Lesson 2 - Loops and Animation	Lesson 3 - Creating a Scene	Lesson 4 - Jumping over Obstacles	Lesson 5 - Storytelling	Lesson 6 - User Interaction	Lesson 7 - Guessing Game	Lesson 8 - Rotation
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use blocks to create a program</li> <li>Sequencing of steps</li> <li>Use simple animation</li> <li>Use sounds</li> <li>Use loops for repetition</li> </ul>	<ul style="list-style-type: none"> <li>Create and animate Actors</li> <li>Add background and sounds to a scene</li> </ul>	<ul style="list-style-type: none"> <li>Add sounds to Actors</li> <li>Handle key-press events</li> <li>Animate character when clicked</li> </ul>	<ul style="list-style-type: none"> <li>Move Actors up and down using changes in y-values</li> </ul>	<ul style="list-style-type: none"> <li>Use speech bubbles to make Actors have a conversation</li> <li>Use different kinds of speech bubbles to convey emotion</li> <li>Use a delay to control timing</li> </ul>	<ul style="list-style-type: none"> <li>Move Actors using keyboard controls and changes in x- and y- values</li> </ul>	<ul style="list-style-type: none"> <li>Use conditional statements and branching logic</li> <li>Use some math operators</li> <li>Wait for a signal</li> </ul>	<ul style="list-style-type: none"> <li>Use direction and turning</li> </ul>
CCSS-Math Standards	MP.1	MP.1	MP.1	MP.1 5.G.1 6.NS.5	MP.1	MP.1 5.G.1 6.NS.5	MP.1 5.G.1 5.G.2 6.NS.6	MP.1 5.G.1 5.G.2 6.NS.6
CCSS-ELA Standards	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.W.3, 6.W.3 5.W.4, 6.W.4 5.L.1, 6.L.1 5.L.2, 6.L.2 5.L.3, 6.L.3 5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.W.3, 6.W.3 5.W.4, 6.W.4 5.L.1, 6.L.1 5.L.2, 6.L.2 5.L.3, 6.L.3 5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Use loops to create a basic stop-motion animation.	Create a natural environment scene with sounds from that habitat.	Create a slideshow on a historical event. Add actors and record your own voice for narration.	Create a scene with multiple Actors that animate and jump up and down when clicked.	Create a dialogue that tackles a digital citizenship issue such as cyber bullying.	Update the natural environment scene to make various animals move and speak.	Create an interactive quiz game to assess knowledge about any subject.	Create a scene with multiple Actors that can animate, move, flip and rotate.

# Programming 201

# Grades 5-6

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 201 is a course for students in grade 5 or 6 who are new to Tynker. The stories, games, puzzle and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Alien Invaders	Lesson 10 - Music and Animation	Lesson 11 - Instruments and Tempo	Lesson 12 - Broadcasting and Messages	Lesson 13 - Time Limits	Lesson 14 - Message Driven Programming	Lesson 15 - Pop the Balloon	Lesson 16 - Animation with Movement
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use screen bounds to make Actors bounce at screen edge</li> <li>Move Actors to random screen locations using random numbers</li> <li>Make Actors appear and disappear</li> </ul>	<ul style="list-style-type: none"> <li>Add background music for an Actor</li> </ul>	<ul style="list-style-type: none"> <li>Generate music using musical notes, various instruments, and changing tempos</li> </ul>	<ul style="list-style-type: none"> <li>Send and receive messages between Actors</li> </ul>	<ul style="list-style-type: none"> <li>Use properties of other Actors</li> <li>Make a simple timer to control a game</li> <li>Troubleshoot and debug a program</li> </ul>	<ul style="list-style-type: none"> <li>Make Actors perform different animations based on the messages they receive</li> </ul>	<ul style="list-style-type: none"> <li>Receive a message to run a program</li> <li>Use animation techniques to simulate explosions</li> </ul>	<ul style="list-style-type: none"> <li>Send a message to make an Actor move, animate and make sounds at the same time</li> </ul>
CCSS-Math Standards	MP.1 5.G.1 5.G.2 6.NS.6	MP.1	MP.1	MP.1	MP.1 5.G.1 5.G.2 6.NS.6	MP.1	MP.1 5.G.1 5.G.2 6.NS.6	MP.1 5.G.1 5.G.2 6.NS.5 6.NS.6
CCSS-ELA Standards	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Create a two-player space shooter game.	Use music to create a game where robots battle to mimic the sound sequence.	Build a traditional piano and a unique piano.	Create an interactive musical activity involving multiple Actors.	Create a timed two-player game.	Program a BeatBot to perform dance moves.	Create a balloon-popping game with explosion effects.	Combine animation with music and movement to create a music video.

# Programming 201

# Grades 5-6

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 201 is a course for students in grade 5 or 6 who are new to Tynker. The stories, games, puzzle and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 17 - Obstacle Course							
<b>Key Skills and Concepts</b>	<ul style="list-style-type: none"> <li>Use nested loops to repeat specific actions</li> <li>Make Actors follow other Actors and cursor</li> <li>Make Actors bounce when they reach screen edge</li> </ul>							
<b>CCSS-Math Standards</b>	MP.1 5.G.1 5.G.2 6.NS.6							
<b>CCSS-ELA Standards</b>	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7							
<b>CSTA Computer Science Standards</b>	1B-AP-10 1B-AP-11 1B-AP-15							
<b>ISTE Standards</b>	1.c 4.a, 4.b, 4.d 5.c, 5.d							
<b>UK National Curriculum</b>	Keystages 2 & 3 Computing*							
<b>Sample Application of Skills</b>	<p>Create an obstacle course or a parade featuring animated Actors.</p> <p>Apply all concepts to build a highly interactive project.</p>							

# Programming 202

# Grades 5-6

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 202 is a course for students in grade 5 or 6 who have completed Tynker's Programming 201 course. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Pen Drawing	Lesson 2 - Follow the Leader	Lesson 3 - Changing Actor Size	Lesson 4 - Changing Pen Color	Lesson 5 - Detecting Colors	Lesson 6 - Avoiding Obstacles	Lesson 7 - Geometry	Lesson 8 - Game Effects and Rules
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use the pen drawing tool and change pen settings</li> <li>Point toward the mouse pointer</li> </ul>	<ul style="list-style-type: none"> <li>Make Actors follow other Actors and cursor</li> <li>Move Actors to random screen locations using random number generators</li> <li>Make Actors appear and disappear</li> </ul>	<ul style="list-style-type: none"> <li>Make Actors change their size, and create the illusion of perspective</li> </ul>	<ul style="list-style-type: none"> <li>Change the color and size of pen for drawing</li> </ul>	<ul style="list-style-type: none"> <li>Detect colors, touches, and screen bounds</li> </ul>	<ul style="list-style-type: none"> <li>Use keyboard controls to point and turn Actors</li> <li>Apply a variety of graphic effects to Actors.</li> </ul>	<ul style="list-style-type: none"> <li>Draw geometric shapes</li> </ul>	<ul style="list-style-type: none"> <li>Handle advanced events</li> <li>Use conditional statements to trigger special graphic and sound effects</li> </ul>
CCSS-Math Standards	MP.1	MP.1 5.G.1 5.G.2 6.NS.6	MP.1	MP.1	MP.1	MP.1 5.G.1 6.NS.5	MP.1	MP.1
CCSS-ELA Standards	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15	1B-AP-10 1B-AP-11 1B-AP-15 2-AP-12
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Draw shapes and patterns using pen drawing commands.	Build a chase game where creatures or vehicles chase after each other.	Program a racer to jump over enemy lines to reach its goal.	Create an Etch-a-Sketch© style drawing machine.	Make Actors interact with each other by detecting touches and colors.	Create an obstacle course	Draw a variety of geometric shapes using a racer.	Create a game using ghosting, portals, sound effects, and advanced rules.

# Programming 202

# Grades 5-6

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 202 is a course for students in grade 5 or 6 who have completed Tynker's Programming 201 course. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - The Physics Engine	Lesson 10 - Gravity and Bouncing	Lesson 11 - Static Platforms	Lesson 12 - Basketball	Lesson 13 - Impulses	Lesson 14 - Projectiles	Lesson 15 - Timers	Lesson 16 - Asteroid Pong
Key Skills and Concepts	<ul style="list-style-type: none"> <li>• Activate and use the physics engine</li> </ul>	<ul style="list-style-type: none"> <li>• Apply gravity and restitution to Actors</li> </ul>	<ul style="list-style-type: none"> <li>• Apply active and static properties to Actors</li> </ul>	<ul style="list-style-type: none"> <li>• Apply physics and animation skills and concepts</li> </ul>	<ul style="list-style-type: none"> <li>• Apply impulses to projectiles to affect how fast they move</li> </ul>	<ul style="list-style-type: none"> <li>• Apply expert physics commands to shoot projectiles at multiple targets</li> </ul>	<ul style="list-style-type: none"> <li>• Use timers and keyboard controls to increase interactivity and control over actors</li> <li>• Apply mathematical operators in conditional statements</li> </ul>	<ul style="list-style-type: none"> <li>• Use multiplayer animations that switch from one animation to another</li> <li>• Broadcast messages to all Actors</li> </ul>
CCSS-Math Standards	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1
CCSS-ELA Standards	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	5.RF.4 6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12	1B-AP-09 1B-AP-10 1B-AP-11 1B-AP-13 1B-AP-15 1B-AP-17 2-AP-12
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Create a structure using multiple platforms and blocks, where the laws of physics apply.	Create a simulation where the direction of gravity can be changed with keyboard controls. Create a bug volleyball game.	Build a game with balls or winged creatures that can be shot out of a cannon to knock down a structure that might have hoofed animals in it.	Make a fully-functional basketball game using the physics engine.	Create a game involving shooting cannonballs at moving targets.	Develop a cannon simulation where a variety of projectiles can be shot at multiple targets.	Create a cannonball shooting game with more finely-tuned controls.	Create a timed multiplayer game involving collisions and other physics concepts.



# Programming 301

# Grades 7-8

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 301 is a course for students in grade 7 or 8 who are new to Tynker. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 2 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Introduction	Lesson 2 - Animated Motion	Lesson 3 - Actor Positioning	Lesson 4 - Motion and Tracking	Lesson 5 - Conditional Loops	Lesson 6 - Show and Hide	Lesson 7 - Actor Properties	Lesson 8 - Nested Loops
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use blocks to create a program</li> <li>Sequencing of steps</li> <li>Use simple animation</li> <li>Use sounds</li> <li>Use loops for repetition</li> </ul>	<ul style="list-style-type: none"> <li>Add a background and Actors to a scene</li> <li>Add sounds to a background and to Actors</li> </ul>	<ul style="list-style-type: none"> <li>Show/hide Actors, and make them appear in a new position using x- and y-coordinates</li> </ul>	<ul style="list-style-type: none"> <li>Detect conditions</li> <li>Handle key-press events</li> <li>Make Actors perform specific actions when they touch others</li> </ul>	<ul style="list-style-type: none"> <li>Use functions to handle sub-tasks</li> <li>Use conditional loops</li> <li>Use animation</li> </ul>	<ul style="list-style-type: none"> <li>Handle advanced events</li> <li>Use advanced motion techniques</li> </ul>	<ul style="list-style-type: none"> <li>Use direction and turning</li> <li>Use properties of Actors</li> <li>Use math operators</li> <li>Use conditional statements and branching logic</li> </ul>	<ul style="list-style-type: none"> <li>Use nested loops to give multiple lives to Actors</li> <li>Move Actors to various screen locations using random number generators</li> </ul>
CCSS-Math Standards	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1
CCSS-ELA Standards	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Create a game with an Actor, a background, music, motion, enemies and treasures.	Create a monster mash dance party.	Create a hide and seek game.	Create a castle maze.	Create game with new animation techniques.	Create wizards vs. zombies game.	Create a fireball tennis game.	Create a hero vs. enemy game.

# Programming 301

# Grades 7-8

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 301 is a course for students in grade 7 or 8 who are new to Tynker. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 2 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Messaging	Lesson 10 - Start Screen and Controls	Lesson 11 - Shoot Projectiles	Lesson 12 - Parallax Scrolling	Lesson 13 - Cloning	Lesson 14 - Variables	Lesson 15 - Power-Ups and Effects	Lesson 16 - Boss Battle
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Send, receive, and broadcast messages</li> <li>Use conditional wait</li> <li>Create Win and Game Over screens</li> </ul>	<ul style="list-style-type: none"> <li>Create a start screen with a start button and a broadcasted message</li> <li>Create button using Art Studio</li> <li>Set the rotation style of Actors</li> </ul>	<ul style="list-style-type: none"> <li>Use further types of conditional loops</li> <li>Use screen bounds</li> <li>Make Actors bounce when they reach screen edge</li> </ul>	<ul style="list-style-type: none"> <li>Use and change layers</li> <li>Send Actors to front or back</li> <li>Create a scrolling background with parallax effect</li> <li>Use advanced animation techniques</li> </ul>	<ul style="list-style-type: none"> <li>Clone Actors</li> <li>Make clones behave in specific ways</li> </ul>	<ul style="list-style-type: none"> <li>Add and change variables</li> <li>Use local and global variables, like health and score</li> </ul>	<ul style="list-style-type: none"> <li>Use graphic effects like changing color</li> <li>Use true/false variables</li> <li>Use a variable timer</li> </ul>	<ul style="list-style-type: none"> <li>Use more advanced motion techniques</li> </ul>
CCSS-Math Standards	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1 MP.2 MP.4	MP.1 MP.2 MP.4	MP.1 MP.2 MP.4
CCSS-ELA Standards	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-11 2-AP-12 2-AP-13
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Build an adventure game.	Create a top-down arcade game.	Create a game where heroes avoid enemies.	Create a game with a scrolling background with the parallax effect.	Create a 2-player airplane battle game.	Create a snowball fight game.	Create a game involving character health and a power-up.	Create a hero vs. enemy game with advanced motion techniques.

# Programming 301

# Grades 7-8

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 301 is a course for students in grade 5 or 6 who are new to Tynker. The stories, games, puzzle and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 1 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 17 - Finishing Touch							
<b>Key Skills and Concepts</b>	<ul style="list-style-type: none"> <li>Store letters or words as value of a variable</li> </ul>							
<b>CCSS-Math Standards</b>	MP.1 MP.2 MP.4							
<b>CCSS-ELA Standards</b>	7.RI.4, 8.RI.4 6-8.RST.3 6-8.RST.4 6-8.RST.7							
<b>CSTA Computer Science Standards</b>	2-AP-11 2-AP-12 2-AP-13							
<b>ISTE Standards</b>	1.c 4.a, 4.b, 4.d 5.c, 5.d							
<b>UK National Curriculum</b>	Keystages 2 & 3 Computing*							
<b>Sample Application of Skills</b>	Finish top-down arcade game with advanced variable and motion techniques.							

# Programming 302

# Grades 7-8

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 302 is a course for students in grade 7 or 8 who have completed Tynker's Programming 301 course. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 2 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - Object Stacking	Lesson 2 - Applying Impulses	Lesson 3 - Line Animation	Lesson 4 - Physics Properties	Lesson 5 - Ricochet	Lesson 6 - Explosions	Lesson 7 - Changing Direction	Lesson 8 - Gravity Sling
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Activate the physics engine and use expert physics commands</li> <li>Apply gravity to Actors</li> </ul>	<ul style="list-style-type: none"> <li>Apply impulses to projectiles to affect how fast they move</li> </ul>	<ul style="list-style-type: none"> <li>Draw geometric shapes, using positions of the cursor and Actors</li> </ul>	<ul style="list-style-type: none"> <li>Create moving targets</li> <li>Control behavior and graphic effects for Actors after they've been hit by projectiles</li> </ul>	<ul style="list-style-type: none"> <li>Apply density and restitution to Actors</li> </ul>	<ul style="list-style-type: none"> <li>Use simple variables</li> <li>Use conditional loops</li> </ul>	<ul style="list-style-type: none"> <li>Change direction of projectiles after launch</li> </ul>	<ul style="list-style-type: none"> <li>Apply gravity and special visual effects to simulate the behavior of a black hole</li> </ul>
CCSS-Math Standards	MP.1	MP.1	MP.1	MP.1	MP.1	MP.1 7.EE.4	MP.1 7.EE.4	MP.1 7.EE.4
CCSS-ELA Standards	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13 2-AP-15	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Create a skyscraper with multiple platforms.	Develop a game where Actors can knock a structure over.	Create a Gravity Drawing Tool and Gravity Sling.	Build a shooting gallery game with asteroids and aliens.	Create a gravity maze where balls bounce off walls and gravity can be changed.	Build a Bug Soccer game where insects kick an Actor around. Create an explosion that can knock out a space platform.	Design a space slingshot game with specially programmable projectiles.	Create a black hole that sucks up Actors that stray too near.

# Programming 302

# Grades 7-8

## Scope and Sequence

Each lesson takes about one class period to complete.

Programming 302 is a course for students in grade 7 or 8 who have completed Tynker's Programming 301 course. The stories, games, puzzles, and projects engage students in developing computational thinking skills, as listed below from the CSTA Level 2 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Linear Velocity	Lesson 10 - Double Jump	Lesson 11 - Receiving Values	Lesson 12 - Lists	Lesson 13 - Laser Tennis	Lesson 14 - Enemy AI	Lesson 15 - Leaderboards	Lesson 16 - Platform Movement
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Add and use functions to simplify programming</li> <li>Apply linear velocity</li> </ul>	<ul style="list-style-type: none"> <li>Detect collisions, apply impulses, and run pre-programmed animation sequences so an Actor will jump twice</li> </ul>	<ul style="list-style-type: none"> <li>Check and change property values of an Actor</li> </ul>	<ul style="list-style-type: none"> <li>Add and manage lists</li> </ul>	<ul style="list-style-type: none"> <li>Check and use list inventory</li> </ul>	<ul style="list-style-type: none"> <li>Apply list operations</li> </ul>	<ul style="list-style-type: none"> <li>Interact with user to collect name data</li> <li>Program a leaderboard to track high scores in a game</li> </ul>	<ul style="list-style-type: none"> <li>Apply velocity vectors to make platforms move</li> <li>Apply further list operations</li> </ul>
CCSS-Math Standards	MP.1 7.EE.4	MP.1 7.EE.4	MP.1 7.EE.4	MP.1 7.EE.4	MP.1 7.EE.4	MP.1 7.EE.4	MP.1 7.EE.4	MP.1 7.EE.4
CCSS-ELA Standards	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7	6-8.RST.3 6-8.RST.4 6-8.RST.7
CSTA Computer Science Standards	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13	2-AP-11 2-AP-12 2-AP-13
ISTE Standards	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d	1.c 4.a, 4.b, 4.d 5.c, 5.d
UK National Curriculum	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*	Keystages 2 & 3 Computing*
Sample Application of Skills	Develop the physics in a platformer game so an Actor can run off a platform and drop down.	Create a side-scroller game with moving platforms and double-jumping Actors.	Program the "health" and "damage" properties for Actors in a game where robots are attacking.	Create a game where the hero collects power-ups while avoiding laser-shooting enemies.	Make a laser tennis game using a list data structure.	Create an enemy robot that changes position based on data stored in a randomized list of values.	Use global variables to implement a leaderboard for high scores in a game.	Build a more complex platform game with power-ups, special hero moves, and platforms that appear to fly by the screen.

# JavaScript 101

# Grades 7+

## Scope and Sequence

Each lesson takes about one class period to complete.

JavaScript 101 is a course for students in grade 7 or above who are already familiar with the basics of programming. The stories, games, puzzles, and projects engage students in developing computational thinking skills in JavaScript, as listed below from the CSTA Level 3 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - The Basics	Lesson 2 - Loops and Patterns	Lesson 3 - Conditional Logic	Lesson 4 - Conditional Loops	Lesson 5 - Variables	Lesson 6 - Expressions	Lesson 7 - Using the Canvas	Lesson 8 - User Interaction	
Key Skills and Concepts	<ul style="list-style-type: none"> <li>• Create custom sequences to solve puzzles</li> <li>• Use function calls</li> <li>• Use JavaScript syntax, naming conventions, and comments</li> </ul>	<ul style="list-style-type: none"> <li>• Use simple, nested, and “for” loops</li> <li>• Use arithmetic operators</li> <li>• Recognize patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Distinguish between assignment, comparison, and logical operators</li> <li>• Use conditional logic to program algorithms</li> </ul>	<ul style="list-style-type: none"> <li>• Use “while” and “do-while” loops</li> <li>• Use conditional loops to solve puzzles</li> <li>• Distinguish between “for” and “while” loops</li> </ul>	<ul style="list-style-type: none"> <li>• Use variable declarations and assignments</li> <li>• Use and define strings</li> <li>• Use variables to solve puzzles</li> </ul>	<ul style="list-style-type: none"> <li>• Write and understand JavaScript expressions</li> <li>• Use operator precedence to evaluate an expression</li> </ul>	<ul style="list-style-type: none"> <li>• Use canvas elements, sprites, and layering</li> <li>• Create game using HTML &amp; JavaScript</li> <li>• Create timed loops that execute code with a time delay</li> </ul>	<ul style="list-style-type: none"> <li>• Set up and handle keyboard and mouse events</li> <li>• Find the correct key code to handle a specific keyboard input</li> </ul>	
CCSS-Math Standards	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	-	
CCSS-ELA Standards	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6
CSTA Computer Science Standards	2-AP-12 2-AP-14	2-AP-12 2-AP-14	2-AP-11 2-AP-12 2-AP-14	2-AP-12 2-AP-14	2-AP-11 2-AP-12 2-AP-14	2-DA-07 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-12 2-AP-13 2-AP-14	2-AP-12 2-AP-13 2-AP-14	
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	
UK National Curriculum	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	
Sample Application of Skills	Use function calls, naming conventions, and syntax to solve puzzles.	Use “for” loops, arithmetic operators, and sequencing to solve puzzles.	Use sequencing, operators, and conditional logic to solve puzzles.	Use conditional loops and pattern recognition to solve puzzles.	Use variables to store and manipulate information to solve puzzles.	Use expressions to solve puzzles.	Create a slideshow using images and delays	Create a scene that responds to keyboard and mouse inputs.	

# JavaScript 101

# Grades 7+

## Scope and Sequence

Each lesson takes about one class period to complete.

JavaScript 101 is a course for students in grade 7 or above who are already familiar with the basics of programming. The stories, games, puzzles, and projects engage students in developing computational thinking skills in JavaScript, as listed below from the CSTA Level 3 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Game Design	Lesson 10 - Snake	Lesson 11 - Breakout	Lesson 12 - Pong	Lesson 13 - Final Game				
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use game loops, win/loss conditions, and keeping score functionality</li> <li>Use collision detection</li> </ul>	<ul style="list-style-type: none"> <li>Use HTML and JavaScript syntax and functions</li> <li>Design and create a game on the canvas</li> </ul>	<ul style="list-style-type: none"> <li>Use HTML and JavaScript syntax and functions</li> <li>Design and create a game on the canvas</li> </ul>	<ul style="list-style-type: none"> <li>Use HTML and JavaScript syntax and functions</li> <li>Design and create a game on the canvas</li> </ul>	<ul style="list-style-type: none"> <li>Use HTML and JavaScript syntax and functions</li> <li>Design and create a game on the canvas</li> </ul>	<ul style="list-style-type: none"> <li>Use HTML and JavaScript syntax and functions</li> <li>Design and create a game on the canvas</li> </ul>			
CCSS-Math Standards	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1			
CCSS-ELA Standards	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6			
CSTA Computer Science Standards	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14			
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d			
UK National Curriculum	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*				
Sample Application of Skills	Program sprites to represent the player and the opponent.	Create a "Snake" game.	Create a "Breakout" game.	Create a "Pong" game.	Create and customize three different games – "Flappy Bird", "Alien Invaders", and "Geometry Dash".				

# Python 101

# Grades 7+

## Scope and Sequence

Each lesson takes about one class period to complete.

Python 101 is a course for students in grade 7 or above who are already familiar with the basics of programming. The stories, games, puzzles, and projects engage students in developing computational thinking skills in Python, as listed below from the CSTA Level 3 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 1 - The Basics	Lesson 2 - Loops and Patterns	Lesson 3 - Conditional Logic	Lesson 4 - Conditional Loops	Lesson 5 - Variables	Lesson 6 - Expressions	Lesson 7 - Turtle Tool	Lesson 8 - User Interaction	
Key Skills and Concepts	<ul style="list-style-type: none"> <li>• Create custom sequences to solve puzzles</li> <li>• Use function calls</li> <li>• Use Python syntax, comments, and naming conventions</li> </ul>	<ul style="list-style-type: none"> <li>• Use simple, nested, and “for” loops</li> <li>• Use arithmetic operators</li> <li>• Recognize patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Distinguish between assignment, comparison, and logical operators</li> <li>• Use conditional logic to program algorithms</li> </ul>	<ul style="list-style-type: none"> <li>• Use “while” and “do-while” loops</li> <li>• Solve puzzles using conditional loops</li> <li>• Distinguish between “for” and “while” loops</li> </ul>	<ul style="list-style-type: none"> <li>• Use variable declarations and assignments</li> <li>• Use and define strings</li> <li>• Use variables to solve puzzles</li> </ul>	<ul style="list-style-type: none"> <li>• Write and understand Python expressions</li> <li>• Use operator precedence to evaluate an expression</li> </ul>	<ul style="list-style-type: none"> <li>• Use turtle graphics</li> <li>• Create animations using turtle graphics and Python</li> </ul>	<ul style="list-style-type: none"> <li>• Set up and handle keyboard and mouse events</li> <li>• Find the correct key code to handle a specific keyboard input</li> </ul>	
CCSS-Math Standards	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1		
CCSS-ELA Standards	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6
CSTA Computer Science Standards	2-AP-12 2-AP-14	2-AP-11 2-AP-12 2-AP-14	2-AP-11 2-AP-12 2-AP-14	2-AP-12 2-AP-14	2-AP-11 2-AP-12 2-AP-14	2-DA-07 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-12 2-AP-13 2-AP-14	2-AP-12 2-AP-13 2-AP-14	
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	
UK National Curriculum	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	
Sample Application of Skills	Use function calls, naming conventions, and syntax to solve puzzles.	Use “for” loops, arithmetic operators, and sequencing to solve puzzles.	Use sequencing, operators, and conditional logic to solve puzzles.	Use conditional loops and pattern recognition to solve puzzles.	Use variables to store and manipulate information to solve puzzles.	Use expressions to solve puzzles.	Create an animation using turtle graphics and Python.	Create a scene that responds to keyboard and mouse inputs.	



# Python 101

# Grades 7+

## Scope and Sequence

Each lesson takes about one class period to complete.

Python 101 is a course for students in grade 7 or above who are already familiar with the basics of programming. The stories, games, puzzles, and projects engage students in developing computational thinking skills in Python, as listed below from the CSTA Level 3 Computer Science standards and UK Computing standards. The Common Core State Standards for Mathematics and English Language Arts that students develop are also listed here.

	Lesson 9 - Game Design	Lesson 10 - Snake	Lesson 11 - Connect 4	Lesson 12 - Tetris	Lesson 13 - Final Game				
Key Skills and Concepts	<ul style="list-style-type: none"> <li>Use game loops, win/loss conditions, and keeping score functionality</li> <li>Use collision detection</li> </ul>	<ul style="list-style-type: none"> <li>Use turtle graphics, Python syntax, and functions</li> <li>Design and implement a game</li> </ul>	<ul style="list-style-type: none"> <li>Use turtle graphics, Python syntax, and functions</li> <li>Design and implement a game</li> </ul>	<ul style="list-style-type: none"> <li>Use turtle graphics, Python syntax, and functions</li> <li>Design and implement a game</li> </ul>	<ul style="list-style-type: none"> <li>Use turtle graphics, Python syntax, and functions</li> <li>Design and implement a game</li> </ul>	<ul style="list-style-type: none"> <li>Use turtle graphics, Python syntax, and functions</li> <li>Design and implement a game</li> </ul>			
CCSS-Math Standards	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1	HSN.Q.A.1 HSN.Q.A.2 HSN.Q.A.3 HSA.CED.1 HSA.CED.2 HSA.CED.3 HSA.REI.1			
CCSS-ELA Standards	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6	9.RI.3, 10.RI.3 9.RI.6, 10.RI.6 9.RI.10, 10.RI.10 9.L.3, 10.L.3 9.L.6, 10.L.6			
CSTA Computer Science Standards	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14	2-AP-10 2-AP-11 2-AP-12 2-AP-13 2-AP-14			
ISTE Standards	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d	1.c 4.a, 4.b 5.c, 5.d			
UK National Curriculum	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*	Keystages 3 & 4 Computing*				
Sample Application of Skills	Program sprites to represent the player and the opponent.	Create a "Snake" game.	Create a "Connect 4" game.	Create a "Tetris" game.	Create and customize two games – "Frogga" and "Pong."				

\*See individual lesson guides for details on UK Computer standards