



Time: 30+ minutes

Grades: K-2, 3-5, 6-8

Difficulty: Beginner +

Teacher Guide: Block Coding Puzzles

<https://www.tynker.com/hour-of-code/>

Students will learn to code as they complete fun game-like puzzles. In many puzzles, they begin by building a character, then they use Tynker's block coding language to program that character to navigate through obstacles. Each puzzle introduces new concepts and slightly more challenging scenarios, building on what students have already done. Although students feel like they're playing a game, they're learning computational thinking and the basics of programming logic. Note that the following activities include exciting concept videos that explain computer science concepts: *Candy Quest*, *Space Quest*, and *Dragon Dash*.

Activity Requirements

- *Option 1*: Laptops, desktops, or Chromebooks with a Web browser and an Internet connection
OR
- *Option 2*: iPads or Android tablets with the free Tynker app from the App Store or Google Play Store

Note: Some but not all of these puzzles are available on the Tynker app.

Objectives

Students will be able to apply these concepts:

- Use visual code blocks to program
- Sequence steps in a program
- Use conditional logic
- Use loops for repetition
- Break down a problem and create an algorithm to solve it

U.S. Standards Mapping

- **CCSS-ELA:** 1.RI.3, 2.RI.3, 1.RI.6, 2.RI.6, 1.RI.7, 2.RI.7, 1.RI.10, 2.RI.10, 3.RI.3, 4.RI.3, 3.RI.5, 3.RI.7, 4.RI.7, 1.RF.1, 2.RF.1, 1.RF.4, 2.RF.4, 5.RF.4, 3.RF.3, 4.RF.3, 3.RF.4, 4.RF.4, 1.L.3, 2.L.3, 2.L.6, 6-8.RST.3, 6-8.RST.4, 6-8.RST.7, 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
- **CCSS-Math:** 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
- **CSTA:** 1A-AP-09, 1A-AP-11, 1B-A-5-4, 1B-A-3-7, 1B-A-6-8
- **CS CA:** K-2.AP.12, K-2.AP.13, K-2.AP.14, K-2.AP.16
- **ISTE:** 1.1.c, 1.1.d, 1.4.d, 1.5.c, 1.5.d, 1.6.b, 1.7.c

U.K. Standards Mapping

National Curriculum in England (computing):

Key Stage 1

Pupils should be taught to:

- understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school

- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Key Stage 2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behavior; identify a range of ways to report concerns about content and contact

How to Prepare

- **Sign Up for a Teacher Account** - Although an account is not required, creating a free teacher account will allow you to access teacher guides, answer keys, and tons of additional resources. You'll also be able to create free accounts for your students, monitor their progress, and see their projects.
- **Create Student Accounts** - From your teacher account, you can easily create free student accounts for your students. This will allow them to save their projects and progress, so they can continue coding when they get home! Again, this is not necessary to complete an Hour of Code.
- **Try It Out** - Play around with Tynker before your Hour of Code to familiarize yourself with the puzzles and the Tynker Workshop.
- **Update Your App** - If you're using the Tynker App for tablets, make sure that you have the most recent version of the app downloaded. Older versions may not have all the necessary content to run this year's Hour of Code.

Lesson Guide

It is important to strike a balance between students learning independently and collaboratively. Students often learn programming well when they work in pairs. They can help each other and catch mistakes that the other student makes. We suggest that you read directions aloud as a class, then allow students time to experiment on their own for each step of the project.

Puzzle Options

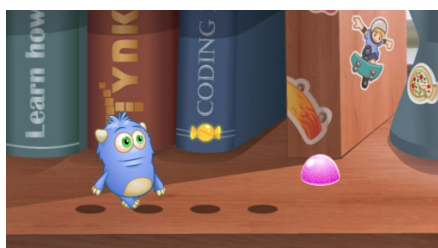
Puzzles are listed in order from easiest to most difficult. Puppy Adventure and Candy Quest are best for younger students or students who have no experience with programming. Hot Wheels: Obstacle Course, Monster High: Scavenger Hunt, Code Monsters, Dragon Dash, and Lost in Space are best for older students or students who have already completed an easier puzzle set. Code Commander and Debugger are best for older students who already have some experience with programming and are looking to take the next step with more complicated and challenging puzzles.



[Puppy Adventure](#) - Beginner (K+). In this puzzle set, students must program Pixel the Puppy to help him get home. They'll work on basic sequencing to navigate him around obstacles, then start adding in more complex programming concepts like conditionals and loops for repetition.

This activity has audio instructions on the web.

[Puzzle Solutions](#)



[Candy Quest](#) - Beginner (K+). Students create a custom character and program the character to navigate obstacles, collect candy, and get back to the computer. Puzzles introduce sequencing, conditionals, and loops. This activity has audio instructions and includes videos that explain coding concepts. Available on the web and Tynker app for iPads and Android tablets.

[Puzzle Solutions](#)



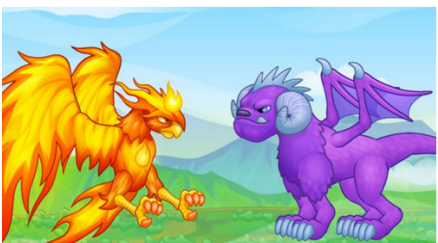
[Hot Wheels: Obstacle Course](#) - Beginner (3+). Students will solve a set of 20 puzzles to navigate a Hot Wheels racecar. They'll learn programming concepts like sequencing, conditionals, loops, while also reinforcing math concepts like distance, speed, changing direction, and acceleration.

[View Full Guide](#)



[Monster High: Scavenger Hunt](#) - Beginner (3+). Students solve 20 coding puzzles to guide Monster High characters through a scavenger hunt. These puzzles get quite challenging in later levels and require students to construct complex algorithms. Also available on the Tynker app for iPads and Android tablets.

[View Full Guide](#)



[Code Monsters](#) - Intermediate (3+). In this fun coding game, students must collect, train, and battle their monsters against a team of rival monsters. To capture and train their monsters, they'll need to use programming to determine the attack logic. As they play, students learn basic programming concepts like conditional logic and sequencing.

[View Full Guide](#)



[Dragon Dash](#) - Intermediate (3+). In each puzzle, students must navigate their dragon to get to the treasure. Each level introduces additional challenges and obstacles, like fireflies and knights, and students must apply computational thinking and programming skills to get past them. They'll learn about sequencing, conditionals, and loops. Note that this activity has videos that explain coding concepts.

[Puzzle Solutions](#)



[Code Commander](#) - Intermediate (6+). Students will use coding to program the attack logic of each member of their army. As they learn, they'll unlock new characters that they can program. Once they've built up their army and programmed their army, they can battle in the multiplayer arena against friends in their class or Tynker students around the world!

[View Full Guide](#)



[Debugger](#) - Intermediate (6+). In this multi-level adventure game, students must find and solve coding puzzles in order to fight bugs and save the motherboard. Students will use the arrow keys to navigate around the world, and along they way they'll solve puzzles. These puzzles are appropriate for students who are already familiar with block-based coding, as well as the basics of sequencing, conditionals, and loops.

[Puzzle Solutions](#)

Lesson Wrap-Up

Encourage students to continue working on the puzzles outside of class and to explore other content in Tynker's Hour of Code, such as games and apps that students can build themselves. In our experience, kids love the opportunity to create projects and experiment with programming, and will voluntarily continue projects at home.

Tell your students that they can create an account on Tynker for free and use it to save and share their projects, play coding puzzles, and make many more projects on their own.



Hour of Code Certificate

Be sure to download a personalized certificate for your students when they complete this activity.

Teacher Guide to Tynker Hour of Code

Tynker's activities combine structured and open-ended components to support multiple learning styles. This experience emphasizes that programming requires not only knowledge of how to use a language, but also creativity and critical thinking to figure out how to build projects. Tynker is offering a wide variety of activities appropriate for all grades and experience levels.

What Tynker Provides

- Self-contained, game-based activities that students can complete with minimal support
- A combination of structured and open-ended activities that teach and allow students to create

- Puzzle solutions for all of our puzzles so you can give hints to any students who get stuck
- Common Core alignment for all activities
- A customized Hour of Code certificate for each activity that will show up in the student dashboard when a student completes an hour of programming

Why Children Love Tynker

- Tynker puzzles use game-based learning to teach programming and computational thinking concepts in a fun way
- Tynker tutorials guide students through all the steps to create storytelling projects, games, animations, and much more
- The Tynker Workshop allows students to create anything they can imagine with code
- Tynker's built-in Physics Engine makes it easy to create exciting projects
- Tynker's high quality media assets give students tons of creative options

Recommended Setup and Logistics

- Ideal environment: a computer lab, library, or classroom with your class
- Students can work individually or in pairs
- Students should have headphones if possible, but if not, you can turn the computer volume down
- Set up a free teacher account on tynker.com prior to the activity and add your students so you can track their progress and share a class showcase—and so students can continue working at home! (Note: Creating a teacher account is optional. You can complete your Hour of Code with Tynker without creating an account.)

We hope you take a look at all of our Hour of Code activities to figure out which one is right for your class. Join the global movement and host your Hour of Code with Tynker!