Platformer Arcade Games Teacher Guide

Summary

- Coding skill level: **Beginner**
- Recommended grade level: **Grades 3-8 (U.S.), Years 4-9 (U.K)**
- Time required: **50 minutes**
- Number of modules: **3 modules**
- Coding Language: **Tynker Blocks**

Teacher Guide Outline

Welcome!
- How to Prepare

Activity
- Overview
- Getting Started (20 minutes)
- DIY Modules (30 minutes)
- Extended Activities

Going Beyond an Hour
- Do More With Tynker
- Tynker for Schools

Help

Welcome!

In today's adventure, students will explore Tynker's Level Editor as they create a fun arcade-style platformer game. The Level Editor is a tool that allows students to create their own multi-level games in Tynker. Activities include using Tynker's Level Editor tool to customize the background for their game, adding/removing tiles on the Stage, customizing their game by adding heroes/villains, adding more game levels, and more!

Students will begin by completing the "Getting Started" activity, where they'll draft different platform designs that they'd like to create in their game. Students will use their platform designs as inspiration to create either of the three platformer games: *Retro Racer, Platform Peril,* or *Outlast the Onslaught*.

Platformer Game	Description
	It's a race against time! Students will design their own obstacle course. Can they reach the flag before time runs out? Let's find out!
	In this classic arcade-style game, the player will need to stomp baddies and collect coins. Students will have the opportunity to invent their own power ups, bad guys, and more. How many points will your students score by the time they reach the end goal?
	Who's ready to defeat enemy ninjas? The player will need to get as many points as they cann while surviving hazards and enemies. Score 10,000 points to win!

Note that each tutorial includes a sample project and project ideas on how students can customize their game. Although each project is pre-coded, students are encouraged to experiment with their code. What unique game ideas will your students come up with?

How to Prepare

This activity is designed for self-directed learning. Your role will be to help students individually and facilitate as they complete the activities. The best way to prepare is to:

1. **Familiarize yourself with the material.** After selecting your Tynker lesson (e.g., Lunar Habitats and Rover Exploration Missions), read through this teacher guide and complete the activity before assigning it to students. This will allow you to troubleshoot anything in advance and plan for potential questions from your students.

2. **Get students excited about coding.** Inspire students and get them excited for the Hour of Code event. Here is a link to resources such as inspirational videos and posters from the Hour of Code website: https://hourofcode.com/us/promote/resources#videos

3. **OPTIONAL: 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.

4. **OPTIONAL: Create student accounts.** From your teacher account, you can easily create free student accounts for all 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 the Lunar Habitats and Rover Exploration Missions lesson.

5. **OPTIONAL: Print certificates to hand out.** While signed in to your Tynker teacher account, you can print certificates by clicking on a classroom from your teacher dashboard, clicking the "Gradebook" tab, going to "Hour of Code," and clicking the "Print All Certificates" button. This will only print certificates for student accounts assigned to the selected classroom.

Activity

Overview

Objectives

Students will...

- Use the Level Editor's Platformer kit to create a custom level
- Add and remove tiles to design different platforms
- Use code blocks to customize an arcade-style game

Materials

- Computers, laptops, or Chromebooks (1 per student)

Vocabulary
- **Code:** The language that tells a computer what to do
- **Actor:** A Tynker character or object that can talk and interact with others
- **Stage:** The background of the project where the Actors are placed
- **Sequence:** The order in which steps or events happen
- **Command:** A specific action or instruction that tells the computer to do something
- **Level Editor:** A tool that allows students to create multi-level games in Tynker

U.S. Standards
- **CCSS-ELA:** RI.3.7, RF.3.4, RF.3.4.A, SL.3.1, RF.4.4.A, RF.1.4.A, RF.4.4, SL.4.1, RF.5.4.A, RF.5.4, SL.5.1, RI.6.4, RI.6.7, SL.6.1, SL.7.1, SL.8.1
- **CCSS-Math:** MP.1
- **CSTA:** 1B-AP-11, 1B-AP-12, 1B-AP-15, 2-AP-16
- **CS CA:** 3-5.AP.10, 3-5.AP.13, 3-5.AP.14, 3-5.AP.17, 6-8.AP.10, 6-8.AP.16
- **ISTE**: 1.c, 1.d, 4.d, 5.c, 5.d, 6.b

U.K. Standards
National Curriculum in England (computing):
- **Key Stage 2 (Years 4-6)**
  - 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
  - Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

- **Key Stage 3 (Years 7-9)**
  - Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
  - Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
  - Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns

Getting Started (20 minutes)

1. Inform students that they're going to use Tynker's Level Editor tool as they create an arcade-style game! Next, briefly play each sample project.

2. Explain to students that in today's coding adventure, they'll need to use the Level Editor's Platformer kit to create a custom level. Students are provided a completed game, but they need to add their own customizations. As a class, discuss what ideas they have to make the game more interesting or increase the level of difficulty.

3. Give students a brief overview of the different categories in the level editor:
   - **Heroes:** Playable character
   - **Villains:** Enemies that patrol left and right
   - **Awards:** Collectibles the player can pick up with the Hero
   - **Obstacles:** Hazards that damage the player on contact
   - **Portals:** Locations that the player must reach to advance to the next level or win the game
   - **Info:** Actors that can display messages on contact
   - **Props:** Decoration for the levels
   - **Backgrounds:** Selectable backgrounds for the levels

4. Next, give students a piece of paper. Then have them sketch 2-3 different platform designs. See if students can sketch a platform for an easy level that doesn't have too many gaps. What would a challenging level that has lots of gaps (at different heights) look like to them? What other ideas do they have?

DIY Module (30 minutes)

This lesson has 3 DIY (do-it-yourself) modules that your students can choose from. Facilitate as students complete the modules on their own:

Arcade Maker
- In this DIY project, students will learn how to use Tynker's Level Editor to create a fun arcade game. Here are the 3 different modules students can choose from: *Retro Racer, Platform Peril,* or *Outlast the Onslaught.*
- **Important:** You can learn fun Level Editor tips and tricks here: https://www.tynker.com/blog/articles/ideas-and-tips/tynker-toolbox-the-level-editor-platformer-blocks/
- Students will need to change the background. Here are some of the provided backgrounds they can choose from:

- Once students finish selecting their own background, they're ready to add and remove tiles that the player can walk on. Are students struggling to think of a design? Direct their attention to the sketches they created in the "Getting Started" activity.
- Encourage students to use different tiles. Here are some of the provided tiles they can choose from:
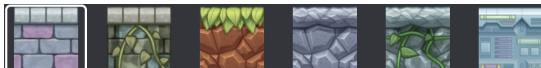
- Point out to students that the tile brush has different sizes: 1x, 3x, and 5x.
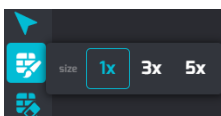
  Explain that "1x" paints a "1 x 1" area with the selected tile, "3x" paints a "3 x 3" area with the selected tile, and "5x" paints a "5 x 5" area with the selected tile. Check for understanding by asking students, "Which tile brush size should you use to paint a large area that uses the same tile?" (Answer: 5x).
- Once students finish adding tiles, they're ready to add characters and other assets to their game!
- If students finish early, ask them to pair up with a neighbor and brainstorm different ideas on how to make their game more challenging.
- Here are some ideas on how students can further customize their game.
  - **Change the music-** Direct your students' attention to the Stage Actor's code. Then ask students to use a loop and a "play sound" code block. Sample solution:
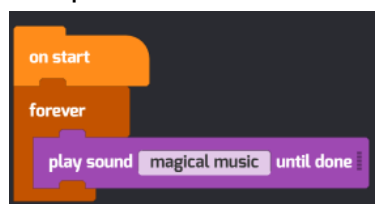
    Students can click the "play sound until done" block's parameter, select "Add Sound", then select music from Tynker's Media Library. What fun music can they find?
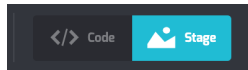
  - **Change the costume-** Students can change the costume of the Actors by selecting the pencil icon:

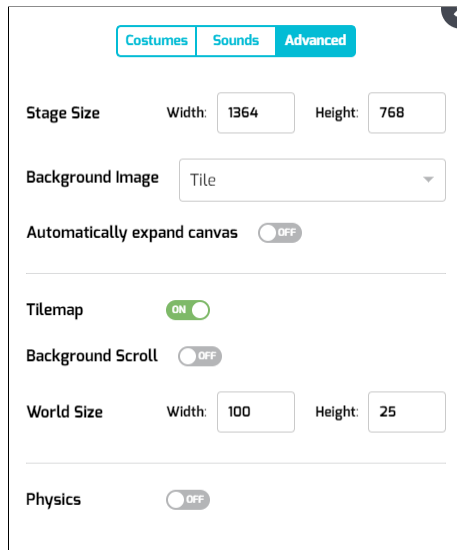   Then they can use the editor tool to customize the Actor.

- ○ **Increase the World size-** Ask students to click the Stage tab:

This image should appear appear:

Students can adjust the width and height of their world by changing the world size values. **Important:** The minimum size limits are: width=18 and height=10. The maximum size limits are: width=100 and height=100.

- Do you have an adventurous coder? Challenge them to change the variables at the top of the hero/villain code. Or they can change the "score" or "time" Actor's code to change the win conditions.

Extended Activities (10 minutes each)

Discussion

Reflect on today's coding adventure by leading a discussion. Ask students:

- What is one piece of advice you would give someone using Tynker's Level Editor for the first time?
- What are some different ways you can customize your game using the Level Editor tool? (Examples: You can design your own world by adding tiles.)
- How do you delete a tile? (Answer: Click the tile trash icon. Then, click on the tile you want to remove.)
- What was your favorite part about creating your own arcade-style game?

<u>Show and Tell</u>
- What unique features or designs did your students add to their game? Did they modify their code? Use your projector to display their unique projects. What coding or design ideas did each student try that others may also use in their own way?

Going Beyond an Hour

If your students enjoyed an Hour of Code, they're sure to enjoy the rest of what Tynker has to offer! Tynker offers a complete premium solution for schools to teach computer science. Over 400 hours of lessons are available to take K-8 students from block coding to advanced text coding. We offer tons of resources for teachers, including comprehensive guides, free webinars, and a forum to connect with other educators.

<u>More Hour of Code Activities</u>

Tynker offers many other tutorials for the Hour of Code, including [STEM Hour of Code](#) lessons that you can integrate into the subjects you already teach. Check out the main Tynker [Hour of Code](#) page to see all the tutorials!

Do More with Tynker

With Tynker, kids don't just acquire programming skills--they explore the world of possibilities that coding opens up. Tynker has several interest-driven learning paths that make coding fun, both inside and outside the classroom:
- **Coding and Game Design:** Your students can use Tynker Workshop, a powerful tool for crafting original programs to make games, stories, animations, and other projects. They can even share their work with other kids in the Tynker Community.
- **Drones and Robotics:** Tynker integrates with connected toys, including Parrot drones and Lego WeDo robotics kits, so kids can see their code come to life.
- **Minecraft:** Tynker integrates with Minecraft so your students can learn coding through a game they love. Tynker offers skin and texture editing, as well as a custom Mod Workshop that lets kids try their original code in Minecraft.

Tynker for Schools

Used in over 90,000 schools, our award-winning platform has flexible plans to meet your classroom, school, or district needs. All solutions include:

- Grade-specific courses that teach visual coding, JavaScript, Python, robotics and drones
- A library of NGSS and Common Core compliant STEM courses that are great for project-based learning
- Automatic assessment and mastery charts for whole schools and individual classes and students
- Easy classroom management with Google Classroom and Clever integration
- Professional training, free webinars and other teacher training resources

Need help getting Tynker started at your school? Contact us to learn more about teaching programming at your school with Tynker!

Help

Need help? Below you'll find answers to frequently asked questions about the Lunar Habitats and Rover Exploration Missions lesson.

What is Hour of Code?

The Hour of Code is a global learning event in which schools and other organizations set aside an hour to teach coding. No prior coding experience from you or your students is needed! The event is held every December during Computer Science Education Week. You can also organize an Hour of Code year-round. The goal of the Hour of Code is to expand access to computer science education for people of all backgrounds. Learning computer science helps students develop logic and creativity, and prepares them for the changing demands of the 21st century. Tynker has been a leading provider of lessons for the Hour of Code since the event began in 2013. Since then, over 100 million students from 180 countries have finished an Hour of Code.

How do I prepare for Hour of Code?

1. **Familiarize yourself with the material.** After selecting your Hour of Code lesson (e.g., Lunar Habitats and Rover Exploration Missions), read through the teacher guide and complete the activity before assigning it to students. This will allow you to troubleshoot anything in advance and plan for potential questions from your students.
2. **Get students excited about coding.** Inspire students and get them excited for the Hour of Code event. Here is a link to resources such as inspirational videos

and posters from the Hour of Code website:
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5. **OPTIONAL: Print certificates to hand out.** While signed in to your Tynker teacher account, you can print certificates by clicking on a classroom from your teacher dashboard, clicking the "Gradebook" tab, going to "Hour of Code," and clicking the "Print All Certificates" button. This will only print certificates for student accounts assigned to the selected classroom.

How can Tynker help me manage my Hour of Code?

Tynker has several free features for registered teachers that will help you manage your Hour of Code. If you set your students up with a Tynker classroom, you will be able to track their progress and print Hour of Code completion certificates for them to keep.

Do I need to create Tynker accounts for my students?

No, you do not need to create Tynker accounts for your students.

What devices do I need?

- **For web:** Computers, laptops, or Chromebooks (1 per student) with an internet connection
- **For mobile:** iPads or Android tablets (1 per student) with an internet connection
- If not enough devices are available, students can work in pairs on the same device

What will my students learn?

Students can create a fun arcade game using the Level Editor. By using the Level Editor, students can add a background to their game, design their world by adding/removing Platform Tiles, and more. Additionally, students will develop debugging and logical reasoning skills as they experiment with code blocks and further customize their game.

How do my students code their project?

The DIY modules include a workspace for students to code their project. The section on the left is a tutorial tab that gives step-by-step directions and ideas on how to get started. If students want to explore different code blocks, ask them to…

- Click this icon to access the Tynker code block palette:

- Click this icon to switch back to the tutorial:

How can I contact the Tynker support team?

If you have any issues or questions, send us an email at support@tynker.com.