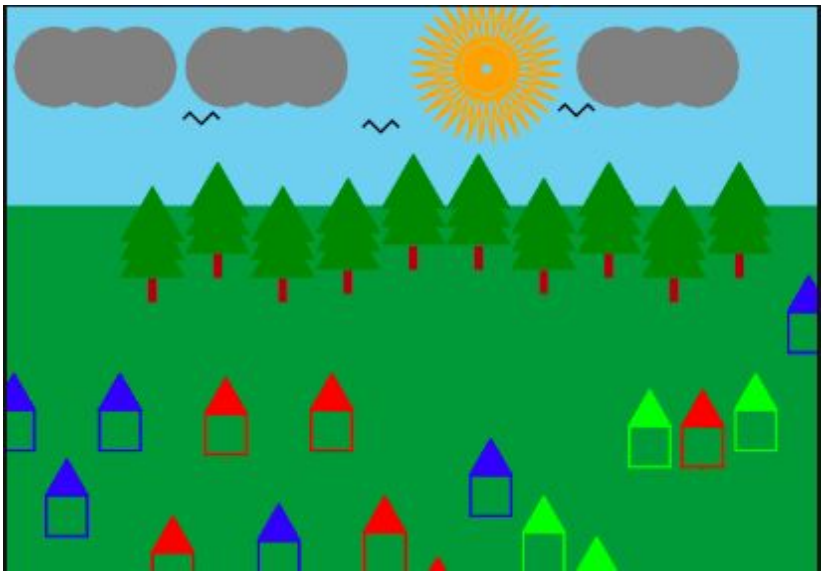
Draw a Landscape Teacher Guide



Summary

- Web address: **tynker.com/hour-of-code/draw-a-landscape**
- Coding skill level: **Advanced**
- Recommended grade level: **Grades 6+**
- Time required: **55 minutes**
- Number of modules: **1 module with 1 tutorial**
- Coding Language: **Python**

Teacher Guide Outline

Welcome!
- How to Prepare

Activity
- Overview
- Getting Started (10 minutes)
- Tutorial (45 minutes)
- Extended Activities

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

Help

Welcome!

Let's create art! In this lesson, students will produce digital art (specifically, 2D graphics) using Python! Students will be provided code to draw a landscape scene, but are encouraged to add or change the code to make it their own. By the end of this lesson, students will have combined creativity, Python syntax, turtle graphics, and coding concepts to create a landscape scene. **Note:** The turtle graphics library contains commands that are used to move an object around the screen. By using the turtle graphics library, students are able to draw shapes and patterns to create a landscape.

How to Prepare

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

1. **Familiarize yourself with the material.** After selecting your Hour of Code lesson (e.g., Draw a Landscape), 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: 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 an Hour of Code.
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

To begin Draw a Landscape, have your students go to this link:
tynker.com/hour-of-code/draw-a-landscape

Overview

Objectives

Students will...

- Apply coding concepts to code a project using Python
- Use Python to create a landscape scene

Materials

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

Vocabulary

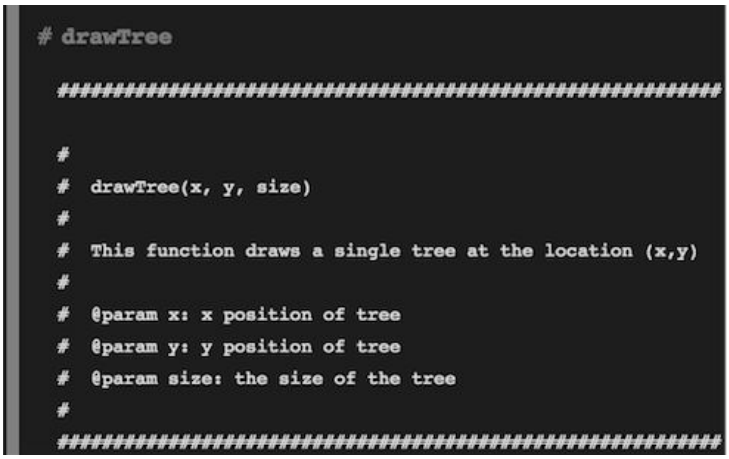
- **Code:** The language that tells a computer what to do
- **Sequence:** The order in which steps or events happen
- **Command:** A specific action or instruction that tells the computer to do something
- **Function:** A sequence of commands that can be run together as if it were a single command
- **Condition:** A logical expression that evaluates to true or false
- **Loop:** An action that repeats one or more commands over and over
- **Conditional loop:** A loop that performs an action if a certain condition is met

Standards

- **CCSS-ELA:** RI.6.7, SL.6.1, SL.7.1, SL.8.1
- **CCSS-Math:** MP.1, 6.GA.3
- **CSTA:** 2-AP-11, 2-AP-15, 2-AP-16, 2-AP-17
- **CS CA:** 6-8.AP.11, 6-8.AP.12, 6-8.AP.16, 6-8.AP.17
- **ISTE:** 1.c, 1.d, 4.d, 5.c, 5.d, 6.b, 7.c

Getting Started (10 minutes)

1. Tell students that they are going to create a landscape scene using Python.
2. Use your projector to display an example of today's activity: tynker.com/hour-of-code/draw-a-landscape
3. Model for your students how to utilize the tutorial. For suggestions, please refer to the Help section of this lesson plan and read "What does the tutorial include?"
4. Optional: Go over the "What does the landscape code example mean?" chart (located in the Help section of this teacher guide) with your students.
5. Optional: Read the code comments out loud to your students. Here is an example of what the comments look like:



```
# drawTree

#################################################

#
#  drawTree(x, y, size)
#
#  This function draws a single tree at the location (x,y)
#
#  @param x: x position of tree
#  @param y: y position of tree
#  @param size: the size of the tree
#
#################################################
```

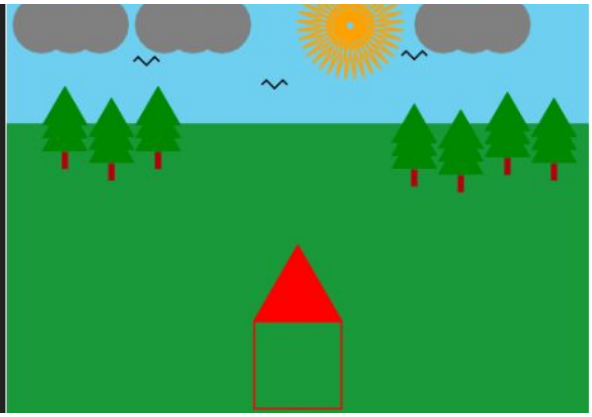
Tutorial (45 minutes)

This lesson has one tutorial. Facilitate as students complete the Draw a Landscape tutorial on their own:

1. Draw a Landscape (Tutorial)

- In this tutorial, students are provided code to draw a landscape scene, but are encouraged to add or change the code to make it their own.
- Tell students to read the comments (noted with the "#" symbol) to understand the given code.
- Do students need help running their program? Please refer to the Help section of this lesson plan and read "How do my students run their code?"
- Encourage students to customize their project! Do students need help customizing their landscape? Please refer to the Help section of this lesson plan and read "How do my students customize their landscape?" OR direct your students' attention to "Step 3: What Can You Do?" in the tutorial.
- **Bonus:** Ask students to draw an alternative landscape with two clusters of trees on the top-left and top-right, and one big house in the center. Below is an example of a suggested solution:

```
# Example Landscape
drawSky()
drawGrass()
drawCloud(-180,370,50)
drawCloud(300,370,50)
drawCloud(-390, 370, 50)
drawSun(0,410, 180)
drawBird(-40,310,"black", 20)
drawBird(-260, 350, "black", 20)
drawBird(200, 360, "black", 20)
drawHouses(0, -150, 1, 150)
drawTrees(-400, 260, 3, 100)
drawTrees(200, 260, 4, 100)
```



Extended Activities

Discussion

Reflect on today's coding adventure by leading a discussion with your students:

- How is block-based coding different from text-based coding? How are they similar?
- What was your favorite part about today's Hour of Code activity? Why?
- How would you describe the turtle graphics library to someone who has never used it before? What does it do?
- Encourage students to describe some of the landscapes they coded: What different landscapes did you create? Did anyone create a flower?
- What is a function? (A sequence of commands that can be run together as if it were a single command)

Experiment With Your Code

Encourage students to experiment with the turtle graphics library and create...

- Polygons
- Different colored lines
- An abstract landscape scene (e.g., red colored grass and a purple sky)

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.

More Hour of Code Activities

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 can 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 80,000 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 Hour of Code and using Draw a Landscape.

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., Draw a Landscape), 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: https://hourofcode.com/us/promote/resources#videos
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How do I open Draw a Landscape?

Have your students open a browser tab to this URL:
tynker.com/hour-of-code/draw-a-landscape

Who is this activity for?

Draw a Landscape is intended for students in grades 6+ with intermediate to advanced coding experience.

What will my students learn?

Students will combine creativity, originality, Python syntax, and coding concepts to create a landscape scene. In this process, students will create art, develop debugging skills, practice coding concepts, and use logical reasoning skills.

What devices do I need?

Students will need computers, laptops, or Chromebooks (1 per student) with an internet connection and an up-to-date browser. If not enough devices are available, students can work in pairs on the same device.

Do I need to create a Tynker Account for my students?

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

What is the turtle graphics library?

The turtle graphics library contains commands that are used to move an object around the screen. By using the turtle graphics library, students are able to draw shapes and patterns.

What does the tutorial include?

The tutorial includes several features and resources to help your students get started! Here's what you will find:

- Step-by-step directions to help your students draw a landscape using Python
- Interactive hyperlinks
    - If you select one of the hyperlinks in the tutorial, it will take you to that specific line of code or to the specified file. For example, clicking the "lines 28-42" hyperlink in the tutorial will take you to "lines 28-42" of your code. From there, students can edit their code. No scrolling needed!

- Suggestions on how your students can change their code to create a different landscape (as specified in "Step 3: What Can You Do?")
- Additional instructions on how your students can create their own landscape (as specified in the "Design Your Own Landscape" section)
- A "Helper Functions Reference Guide" that includes a list of functions with examples and descriptions that students can use as they draw shapes and other outdoor elements such as clouds, a sun, trees, and houses!