Robot Artist

Use this guide to introduce the Robot Artist activity found in Get Started with Algorithms in the Teacher Guide of Develop in Swift Computer Science Principles.

Introduction
1 minute

To start, the entire class will be robots and you'll be the programmer. Robot artists must obey the following instructions:

- Don't talk without raising your hand.
- Don't ask for clarifications. A robot can ask only for an instruction to be repeated.
- Don't look at the work of other robots.
- Execute the commands as faithfully as possible—don't guess what the object is or do any creative interpretation.

Class Activity
5-10 minutes

Read the instructions below slowly, giving students time to complete each step:

1. At the center of your paper, draw a horizontal line half the width of the page. This is one side of a triangle that points down.
2. From each end the first line, draw the two other sides of the triangle. Make each twice as long as the first line. They should meet below the middle of the first line.
3. Above the first line, draw a semicircle that starts at one end and ends at the other.

At this point, some students may recognize what they're drawing. (Remind the class that robot artists aren't allowed to talk, unless they need a command repeated.) You can let the students try to give additional instructions themselves. They'll typically suggest enhancements such as the following:

- Draw diagonal lines inside the triangle that are parallel to its long sides. *(To make a waffle cone)*
- Draw dots inside the semicircle. *(To make chocolate chips)*
- Draw another circle or partial circle on top of the semicircle. *(To make a second scoop)*
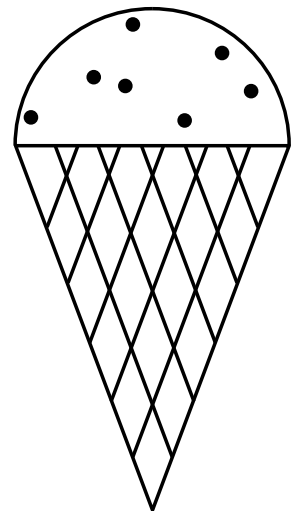
By now, most of the students should know what they're drawing. If so, have them all say it out loud at once.

Breakout
15-20 minutes

Now, students will practice being programmers by following these rules:

- Give step-by-step instructions to draw a common object.
- Use simple terms for the following:
  - Common shapes such as a circle, square, line, and semicircle
  - Measurements such two thirds of the height of the page, five centimeters, or one inch

- Orientations such as vertical and horizontal, or angles such as 45 degrees or five o'clock
- Give only instructions—don't offer suggestions or correct the robots' works in progress.
- Give only verbal commands—don't use your hands or any other aid.
- Don't use language that reveals what the object is. For example, "Draw a circle in the middle of the oval for a nose."

To start, have each student create their own design that nobody else knows.

Divide the class into pairs—or small groups—and practice enough rounds so that each student gets to be the programmer. In each round, the others in the group will be the robot artists. Remind the class of the rules for robot artists.

Tips

Guide programmers to choose simple common objects that can be made from basic shapes and lines.

If a programmer is stuck making a choice, provide ideas—or actual images—for easy-to-draw objects to select from.

Common object suggestions

- Butterfly
- Cat
- Scissors
- House
- Car
- Bicycle
- Kite
- Fish
- Sailboat
- Bird
- Flower
- Umbrella
- Rocket
- Pencil