

matata  
studio

# FUN Coding Manual

for Artist Add-on + Coding Set





## Lesson 1

# Introduction to Coding shapes



## Overview

Geometric shapes are found throughout nature, used in building skyscrapers, analyzed in geometric proofs, and are the basis of art pieces. The MatataStudio Artist Add-On Set, used in conjunction with the MatataStudio Coding Set, gives students the necessary tools to create a large variety of geometric shapes.

In this lesson, students will code MatataBot to draw various geometric shapes using instructions on the six MatataStudio Artist Warm-Up Cards. Students will extend their understanding of coding shapes by exploring ways to create additional shapes.

Additional resources for this lesson can be found at the end of the lesson.

### Essential Objective

- Understand coding and manipulation of MatataBot to create various basic shapes.

### Learning Objectives

- Learn how to code and manipulate MatataBot in order to create each of the six basic shapes on the MatataStudio Draw Warm-Up cards.

## Standards

- NCAS: VA:Cr1.1, VA:Cr1.2, VA:Cr2.1 VA:Cr2.3, VA:Cr3.1
- CSTA: K-2: 1A-CS-01, 1A-AP-10, 1A-AP-11, 1A-AP-12, 1A-1P-14, 1A-AP-15

### Time

60 minutes

### Materials

For each student group:

- 1 MatataStudio Coding Set - Parts used in this lesson will include:
  - Command Tower
  - Control Board
  - MatataBot
  - Direction, Parameter and Loop Blocks
- 1 MatataStudio Artist Add-On Set

- Marker
- Large sheet of white paper (approximately 3 feet x 2 feet)
- Tape
- 1 copy of each worksheet per student
- Student journals

## Teacher Set-Up and Preparation

- Charge all MatataStudio Command Towers and MatataBots.
- Ensure there are enough copies of worksheets for each student.
- Locate a place for each student group to work. Tape a large sheet of paper (approx. 3 ft. x 2 ft.) to table.
- Distribute 1 MatataStudio Coding Set, 1 MatataStudio Artist Add-On Set for each student group.

## Vocabulary

- Shape: The outline appearance of an area or a figure.
- Angle: The space, measured in degrees, between two intersecting points or lines at or close to where they meet.
- Triangle: A plane figure with three straight sides and three angles.
- Square: A plane figure with four straight sides and four right ninety-degree angles.
- Sunburst: A decoration resembling the sun and its rays.

## Introduction

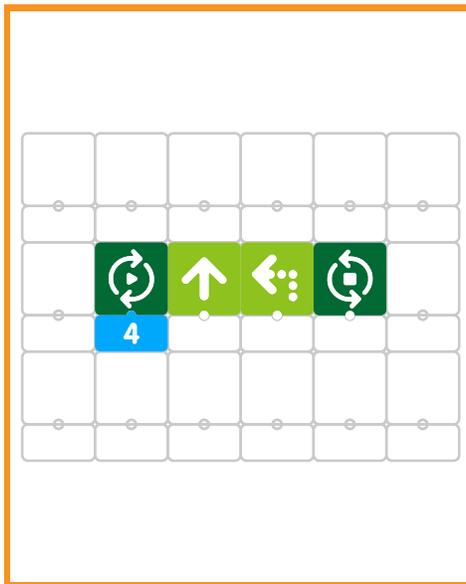
- Are students in a classroom? Are they outside?
- Ask students to look around and make observations about their surroundings; what objects do they see?
- Next, ask students to name some of the shapes of some of these objects. (rectangles of doors, square floor blocks, circle clock, triangular shape of leaves, etc.)
- Discuss with students other places where they can see different shapes.
- Explain to students that in this lesson they will use a robot and programming blocks to draw a variety of shapes.

## MatataStudio Activity

- Point out each of the various parts: Command Tower, Control Board, MatataBot, various types of coding and angle blocks.
- Explain and demonstrate how to turn on both the Command Tower and MatataBot.
- Explain how the tower communicates with the robot via Bluetooth communication.

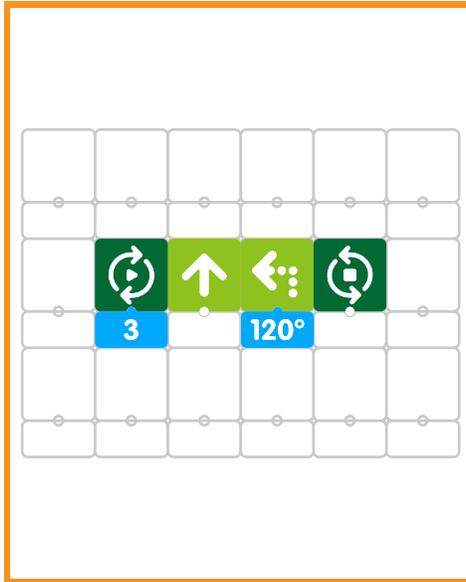
- Ask students to examine Draw 1 Warm-up card. Ask students to name the shape they see on the card. Explain that MatataBot can draw that card using the coded blocks shown below the square.
- Demonstrate how to set up MatataBot with one of the markers and placement of the coding blocks on the Control Board.
- Place the MatataBot on a sheet of paper and press the Play button. Students will observe the movement of MatataBot as it draws a square.
- Allow student groups time to code and draw their own square by following the coding instructions on the Draw 1 Warm-Up Card.
- Explain to students that a left or right turn coding block tells MatataBot to turn 90° to the left or 90° to the right. Demonstrate this movement with student volunteers.

### Draw 1 Warm-Up Card:



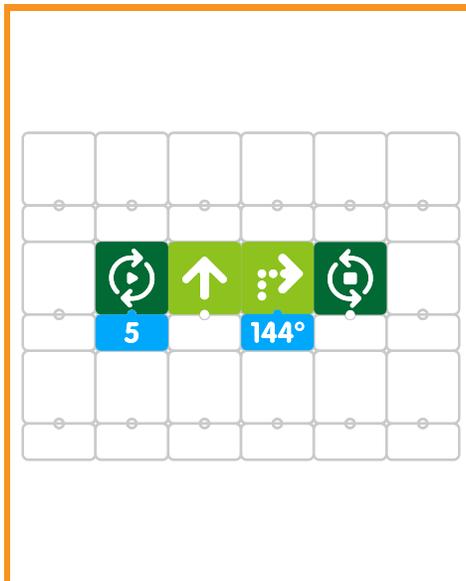
- Tell students to look at the Draw 2 Warm-Up Card. Ask students how this object is different from the square. (It has three sides instead of four and the angles are different. At this point it isn't necessary to explain the size of the angles, but point out that the coding of the triangle is different from the square because it is a different shape, and that each shape has its own unique coding.)
- Allow student groups time to code and draw their own triangle by following the coding instructions on the Draw 2 Warm-Up Card.

Draw 2 Warm-Up Card:

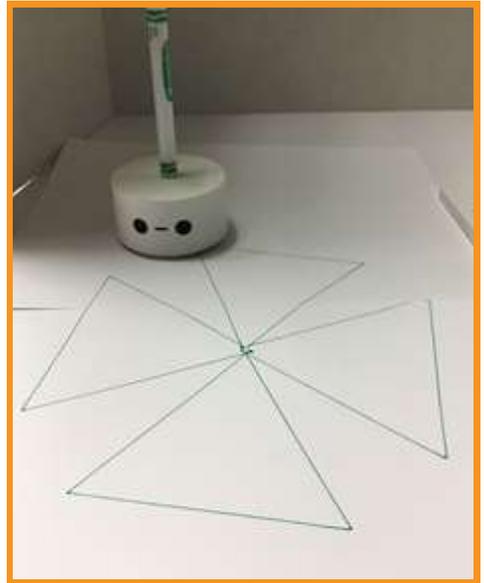
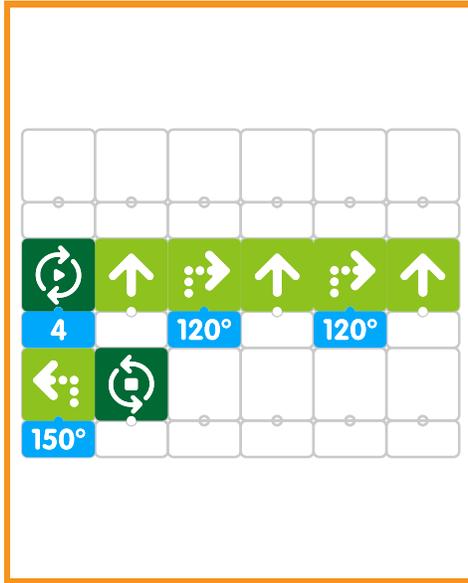


► At this point, students should be allowed to work collaboratively in their groups and continue to code and draw the remaining shapes shown on the Warm-Up Cards. Circulate to help students with coding and answer questions they may have regarding the procedures.

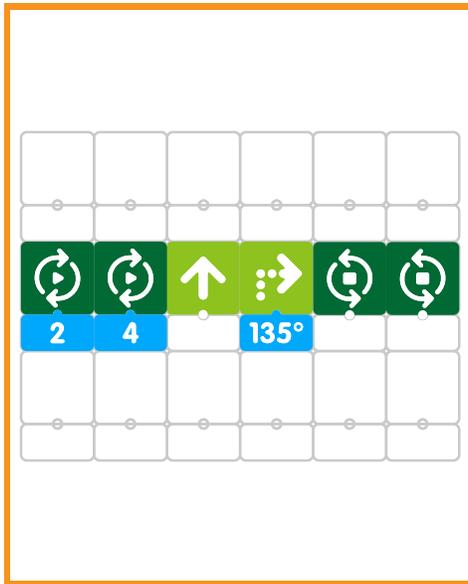
Draw 3 Warm-Up Card:



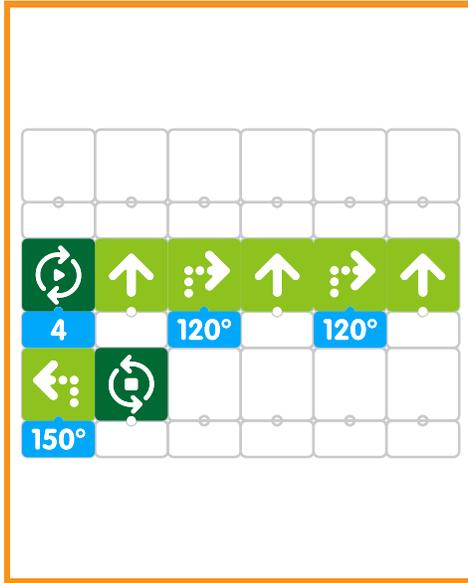
Draw 4 Warm-Up Card:



Draw 5 Warm-Up Card:



## Draw 6 Warm-Up Card:



## Closing

### Assessment

Today we have practiced coding and creation of a variety of shapes using the MatataStudio Artist Warm-Up Drawing Cards. All collaborative groups were given time to complete each of the shapes on the cards.

Have students answer the following questions:

- Which shapes did your group find to be the most difficult to create? Why?
- Which shapes did your group like best?
- How helpful was each of the Warm-Up Drawing Cards in the creation of each shape?
- How would you strengthen or change this project?

Once students have been given a chance to answer these questions, ask students to draw pictures of each of the shapes they created and their experiences with their creations in their journals.



So far we have utilized each of the Artist Warm-Up Drawing Cards which help students to code each shape on each card successfully. Use your student journal to draw and write the coding needed to create a unique shape different than the shapes found on the Warm-Up Drawing Cards. Use MatataStudio Artist Add-On Set along with the MatataBot and command tower to configure the blocks according to your plan and create your unique shape based upon a new configuration. What was the unique shape that you created? How difficult was it to code the creation of that shape?



The MatataStudio Draw Warm-Up Cards give hints and clues that allow you to successfully complete a project. In what other activities might someone get hints and clues to complete something successfully? Do hints and clues help? Why? What would happen if an activity or a project had to be completed without any help or clues? How might this make the completion more difficult? Have you ever worked on a project without any help at all? How did this affect your success with the project?

# Lesson 1 - Introduction to Coding Shapes

Match the Shapes and Tiles with the Correct Description

	Triangle
	Start
	Square
	Right Turn
	Stop
	Forward

## Lesson 2

# Ice Cream Cone



## Overview

As students learned in the first lesson, the simple shapes coded using MatataBot and the Artist Add-On Set can be connected together to make more complex and interesting objects. MatataBot can be coded to draw a square and a triangle to create a house. The length of the sides of these geometric objects can be increased by changing the coding to create larger objects.

In this lesson, students will alter the coding for a triangle to create a larger triangle which will become the cone of an ice-cream cone. Students will then decorate the top to look like ice cream and embellish the ice cream with sprinkles and other decorations.

Additional resources for this lesson can be found at the end of the lesson.

### Essential Objective

- Understand coding and manipulation of MatataBot to create various basic shapes.

### Learning Objectives

- Code and manipulate MatataBot in order to create a large triangle.
- Utilize the large triangle to create a large decorated ice cream cone.

### Standards

- NCAS: VA:Cr1.1, VA:Cr1.2, VA:Cr2.1 VA:Cr2.3, VA:Cr3.1, VA:Cn10.1, VA:Cn10.2
- CSTA: K-2: 1A-CS-01, 1A-AP-10, 1A-AP-11, 1A-AP-12, 1A-1P-14, 1A-AP-15

### Time

60 minutes

### Materials

For each student group:

- 1 MatataStudio Coding Set - Parts used in this lesson will include:
  - Command Tower
  - Control Board
  - MatataBot
  - Direction, Parameter and Loop Blocks

- 1 MatataStudio Artist Add-On Set
- White Cardstock - 2-3 pieces per student
- Scissors
- Markers
- Glitter and/or candy sprinkles
- Glue
- 1 copy of each worksheet per student
- Student journals

## Teacher Set-Up and Preparation

- Create a display model of the ice cream cone with one or two scoops of ice cream.
- Charge all MatataStudio Command Towers and MatataBots.
- Ensure there are enough copies of worksheets for each student.
- Locate a place for each student group to work.
- Distribute a set of materials for each student group.

## Vocabulary

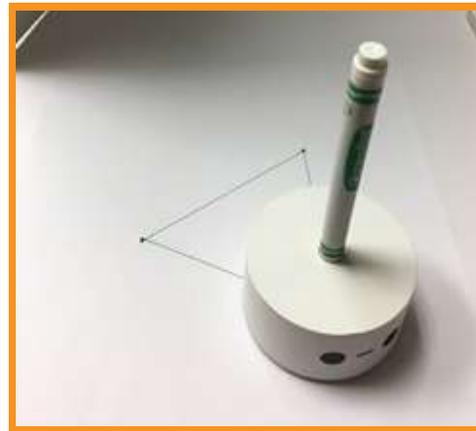
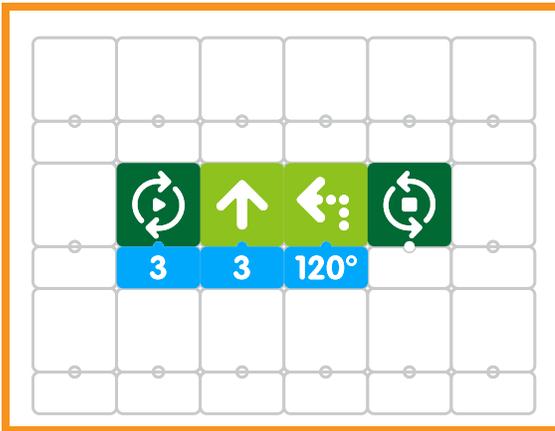
- Triangle: A plane figure with three straight sides and three angles.
- Flavor: The way something tastes when you eat it.
- Geometric Objects: Shapes that include circles, triangles, squares, rectangles and others.
- Weather: The condition of the atmosphere in a given area at a given time and date.

## Introduction

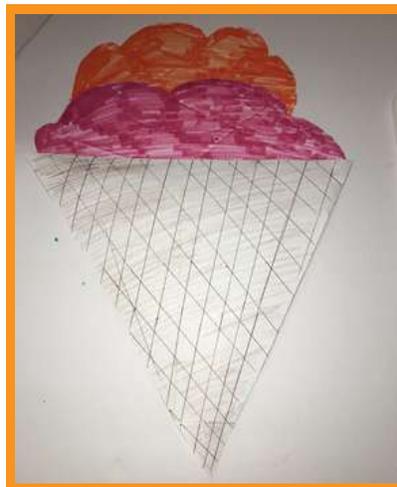
- Ask students to imagine they are outside playing on a hot, hot summer day.
- What would help them cool off? (running through a sprinkler, a dip in a pool, a walk along a beach, maybe an ice cream cone)
- Ask students to name their favorite flavor of ice cream.
- Choose 3-5 flavors and ask students, "Out of these which one do you like the most?"
- Have students stand up, form groups according to their choice and make observations about the number of students who chose each flavor.
- Explain to students that they will code MatataBot to draw an ice cream cone. They will color and cut out the cone, draw and color one or two scoops of ice cream, add sprinkles and assemble their ice cream cone.

## MatataStudio Activity

- Ask students to take out and examine the triangle shown on the Draw 2 Warm-Up Card. Review the coding blocks with students and discuss how MatataBot drew a triangle by reading the coding blocks.
- Ask students what 1 other block they could add to the line of coding in order for MatataBot to draw a larger triangle. (adding an additional  block). Explain that this will give them a larger cone to hold more ice cream.



- Tell students to draw a picture of their ice cream cone on the Planning Worksheet and to plan out and write/draw the coding they will use to draw their cone.
- Check coding on the Planning Worksheet and address any misconceptions.
- Using a piece of white cardstock, student groups will program MatataBot to draw a large triangle that students will use for the cone. Circulate to help students with coding questions.
- Ask students to color their cone, draw and color one or two scoops of ice cream on paper and color the scoops. Students will then cut out their cones and ice cream, glue on sprinkles and/or glitter and assemble their ice cream cone using tape and/or glue.



## Closing

### Assessment

We have planned out, coded, and created a large cone for an ice cream cone. We then decorated the ice cream.

Have students answer the following questions:

- How did you change or modify the coding to enlarge the sides of your triangle cone?
- What surprised you about this project?
- What did you like best about this project?
- What would you change about this project if you could?

Once students have been given a chance to answer and discuss these questions, ask students to draw pictures of each of the shapes they created and write about their experiences with their creations in their journals.

### Extensions

An ice cream cone is a favorite snack or dessert for many people. What are some other snacks or desserts that you like? Some examples might be apple pie, cheesecake, chocolate cake, chocolate bars or candy.

Plan out the coding needed to create a different snack or dessert. Write the coding with the number and angle block configurations needed to create the shapes for your snack or dessert in your student journal.

Using the MatataStudio Coding Set with the Artist Add-On Set, configure the blocks according to your plan, and create your unique snack or dessert. Decorate your unique creation and add other types of media.

### Real World Connections

When eating ice cream, people often like to add additional things like sprinkles, marshmallows, and other types of treats. With what other types of treats do people like to add decorations and other things? Think about the shapes of the things you add on. Think about the shapes of decorations, for example chocolate chips are three dimensional triangles. What other shapes are used for decorations?

# Ice Cream Cone Planning Worksheet

Plan the  
shape for  
your cone

Draw your  
ice cream  
cone

# Lesson 2 - Ice Cream Cones

Copy the coding word. Choose a tile that matches each word. Draw the tile next to the word.

Start		
Forward		
Right Turn		
Angle		
Stop		

