matata studio

Learning Station Manual

for Coding Set

Lesson 1 - 4

Getting Started

Overview

The MatataStudio Coding Set, appropriate for ages 4 to 9, is a block-based, tangible programming tool that allows students to move a robot through an environment by way of a Bluetooth-enabled command tower and board.

The Coding Set includes a Bluetooth-enabled command tower, control board, wheeled robot, and coding blocks. The coding blocks, about the size of two Lego® bricks, allow students to place them in a coding configuration on the control board. The command tower takes a photo of the blocks configuration and at the touch of the orange start button, sends code to move the robot on the map.

Students can utilize and demonstrate their 21st Century skills through collaboration, critical thinking, communication, and creativity.

» Refer to the following videos to learn more:

    » MatataStudio - Coding Like ABC
      https://www.youtube.com/watch?v=FN0CYCl9NkA

    » How Does it Work? The MatataStudio Hands-On Coding Robot Set
      https://www.youtube.com/watch?v=a4Elsi2OyRo

Essential Objectives

» Learn about the components of the MatataStudio Logic Set.
» Learn how to utilize block coding.

Learning Objectives

» Describe the components of the MatataStudio Coding Set.
» Learn about the importance of coding and programming.
» Understand the difference between sending and receiving messages.
» Collaborate with other students as they program MatataStudio robot.
» Challenge each other to program the MatataStudio robot in order to move through different mat/map environments

Standards

- » ISTE: 1c, 3d, 4a, 4d, 5a, 5d,7b, 7c
- » NGSS: K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3
- » CSTA: 1A-CS-01 K-2, 1A-DA-07 K-2, 1A-AP-08 K-2, 1A-AP-09 K-2, 1A-AP-12 K-2, 1A-AP-10 K-2, 1A-AP-11 K-2, 1A-AP-14 K-2, 1A-AP-15 K-2

Time

- » 20 minutes per lesson.

Materials

- » MatataStudio Coding sets – enough for each group of four students

  - » 1 Command Tower
  - » 1 Control Board
  - » 1 Wheeled Robot
  - » 16 Movement Blocks
  - » 4 Function Blocks
  - » 4 Loop Blocks
  - » 8 Numbered and Parameter Blocks
  - » 2 Dice Blocks
  - » 1 Environments Gridded Map
  - » 8 Red Plastic Stand-Up Obstacles
  - » 3 Plastic Color-Coded Stand-Up Flags
  - » Level 1 Challenge Booklet
  - » Student Journals

Teacher Set-Up and Preparation

» Lay out Matatalab Coding Set pieces
» Schedule access to a large open space
» Have Student Journals available

Note: Lessons 1-4 Getting Started focus on introducing MatataStudio and computational thinking. The teacher may want to conduct these lessons in large group with small student cluster groupings.

Student Management

» The introduction will work best in a large group.
» Assign a MatataStudio Coding Set for each collaborative student group with up to four students in a group.

Vocabulary

» **Coding:** The action or process of writing a computer program.
» **Robot:** A machine capable of carrying out a complex set of actions programmed or coded by a computer.
» **Environment:** Area in which a person, animal, or plant lives.
» **Map:** A drawing or representation usually on a flat surface of a whole or part of an area.
» **Message:** A piece of information you send to someone.

LESSON 1

Vocabulary to Get Started (20 Minutes)

Teacher-Led Introduction

"We will be learning about the MatataStudio Coding Set which includes a robot that moves with coding blocks and messages sent from a command tower. The command tower reads the arrangement of blocks that you place on the control board. The tower then sends a message to the robot that allows the robot to move on the map."

» Introduce the meaning of coding, robots and robotics, and sending and receiving messages.
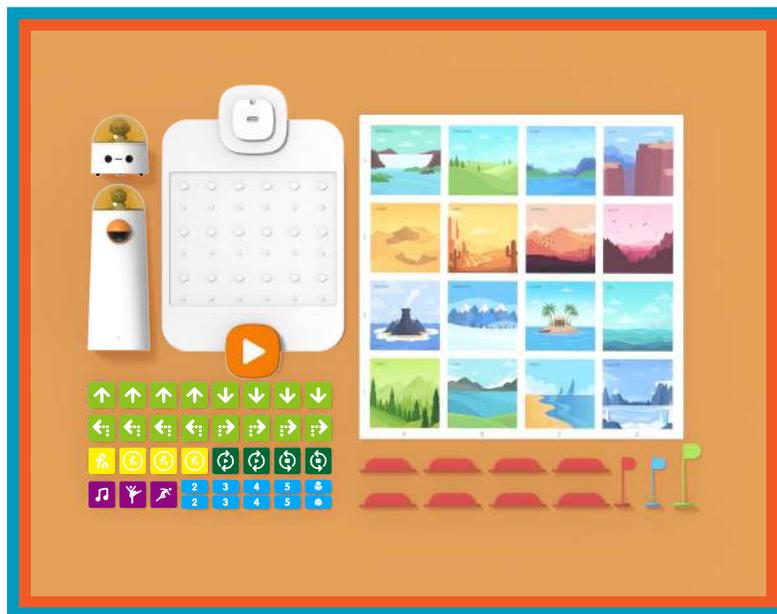
Students Discuss - Create - Share

» Discuss vocabulary in groups.
» Create and draw pictures representing vocabulary.
» Share pictures with the rest of the group.

LESSON 2

Sending and Receiving Messages (20 Minutes)

Activity

Place students into groups of up to 4 in each group. These groups will work together to create at least 3 short simple messages. One message migh t be "School is fun." Another message might be "Today's lunch is a sandwich."Schedule access to a large open space. Before taking the groups to the space, have the students plan their short simple messages.

At the space, arrange students so that half of the group of collaborative teams are on one side of the space and the other half are on the other side of the space. Allow each collaborative team to take a turn sending their messages by yelling them out and allowing the students on the other side of the playground to decide what each message is. Alternate teams by switching and allowing the senders to be the receivers.

Once the groups have had time to send and receive messages, bring students back to the classroom.

Students Discuss - Create - Share

» Discuss the messages, what is meant by sending a message and what is meant by receiving a message. Relate sending and receiving to the functions of the MatataStudio command tower, which sends messages, and the functions of the MatataStudio robot, which receives messages.
» Create and draw a symbol that represents sending a message and a symbol that represents receiving a message in Student Journals.
» Share drawings from Student Journals.

LESSON 3

Understanding Blocks, Obstacles and Destinations (20 Minutes)

Activity

Previous to this lesson, create enough sets of index cards for each collaborative group. Each set of cards should include one card for each of the following:

» Direction and Movement - Picture of an arrow
» Numbers - Picture of a number
» Loops or Circles - Picture of a circle with arrows
» Fn or Function blocks - Picture of "Fn"
» Music, Dancing, or Running Person blocks
» Plastic Stand-up Obstacles - Picture of an obstacle
» Stand-Up Flags - Picture of a flag

Direct students to the MatataStudio Coding Set pieces previously laid out prior to this lesson. Keep students in their previously arranged collaborative groups.

The student will

» Sort the blocks and obstacles by the categories.
» Place the appropriate index card with each set.

Students Discuss - Create - Share

» Discuss the meaning and purpose of each category.
» Create and draw one picture of each category in their Student Journals.
» Share drawings from Student Journals.

LESSON 4

Getting Started with Coding (20 Minutes)

Activity

Ensure that students retain their collaborative groups of four with enough copies of Challenge Booklet Level 1 for each group and a MatataStudio Coding Set for each group.

Students will begin at page one of the booklet, follow the picture and placement of each block and flag destination on the control board. Once the block has been placed, the students should push the big orange button on the control board and check the robot's location against the picture in the booklet to receive immediate feedback about their success. Students will complete Challenge Book Level 1.

Students Discuss - Create - Share

» Discuss exploring the map with blocks and flags.
» Create and draw a route from the book in their Student Journals.
» Share drawings from Student Journals.

Convene the group together for closing.

Assessment

Remind students:

We have learned new vocabulary, information about sending and receiving messages, and we have completed the Level 1 Challenge Booklet of MatataStudio Coding Set.

Answer the following questions:

- » What is meant by coding?
- » How did the MatataStudio robot react to messages sent from the command tower?
- » What types of movement blocks allowed the robot to move forward?
- » What types of blocks allowed the robot to turn?
- » What kinds of environments or locations were on the map?
- » What surprised you most about MatataStudio?
- » What would you change about today's lesson if you could?

Once the students have been given a chance to discuss these questions, students will be given time to draw pictures of MatataStudio command tower, control board, robot, and some of the coding blocks in their Student Journals. Students could share their pictures.

Extensions

Create a book or booklet comparing and contrasting machines that send messages and machines that receive messages.

Create an environment or map to use with the MatataStudio robot. The environment could be based upon a planet or it could be an imaginary country. Students should be challenged to be as creative as possible. Students then use the Coding Set to move the robot around their created environment.

Real World Connections

Think About

Today, there are many satellites that surround and orbit our planet that receive messages as well as send them back to earth like the MatataStudio Command Tower. How important do you think satellites are for our system of communication today? What would happen if these satellites no longer worked? How would

messages be sent and received then? What would be the consequences of this?

Coding or programming is basically a specific list of directions that tell a machine what to do. What are some other examples of activitiess that require specific lists of instructions? One example may be a recipe that must be followed to the letter. If you leave out an ingredient, the baked good might not look right or taste very good.
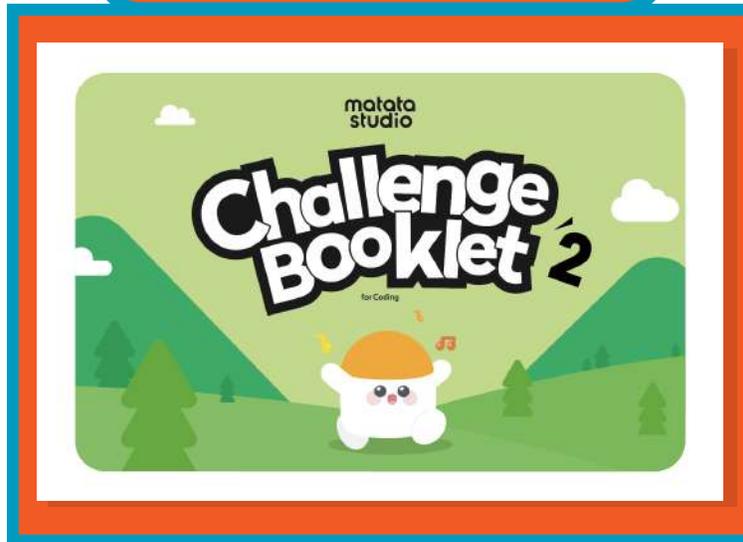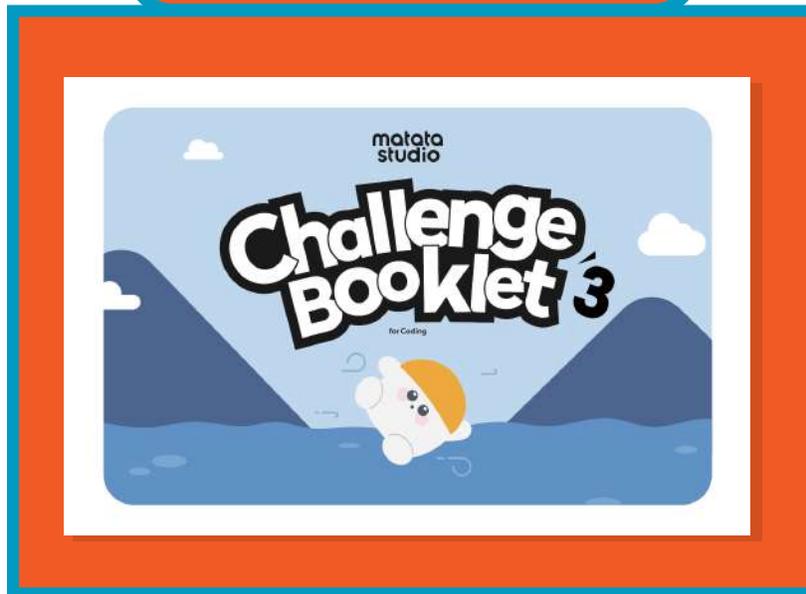
Teacher Resources

Challenge Booklets

CHALLENGE BOOKLET 1

*Challenge Booklet 1 includes- Start, End, Forward, Right Turn, Left Turn, Back

CHALLENGE BOOKLET 2

*Challenge Booklet 2 adds- Obstacles, Parameters, Music Block

CHALLENGE BOOKLET 3

*Challenge Booklet 3 adds- Loop, Function

Print out the following pictures and attach each to an index card. These will be your set of index cards for Lesson Three. Make a set of each of the cards for each collaborative student group.
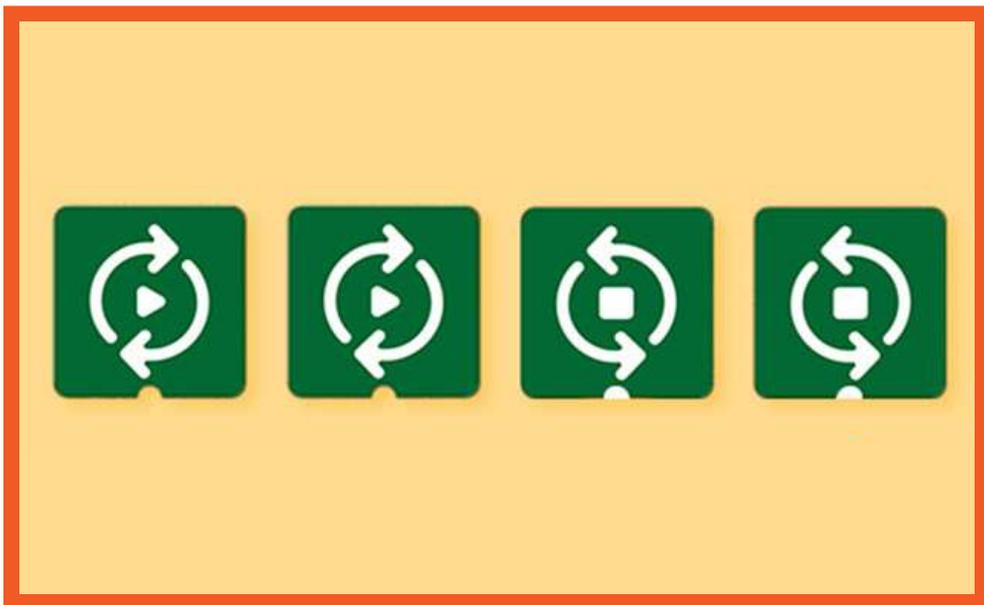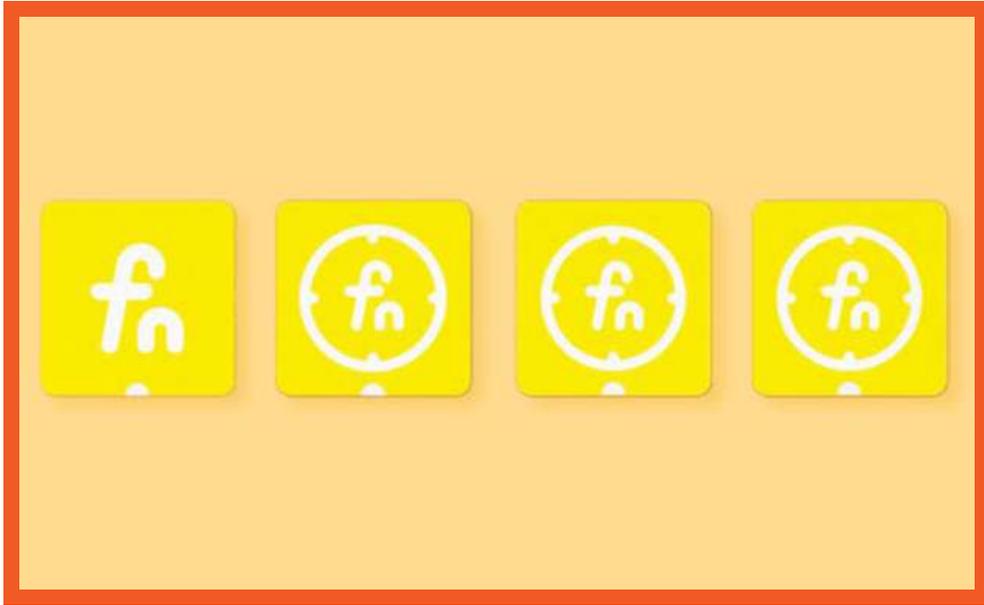
cut out for index card
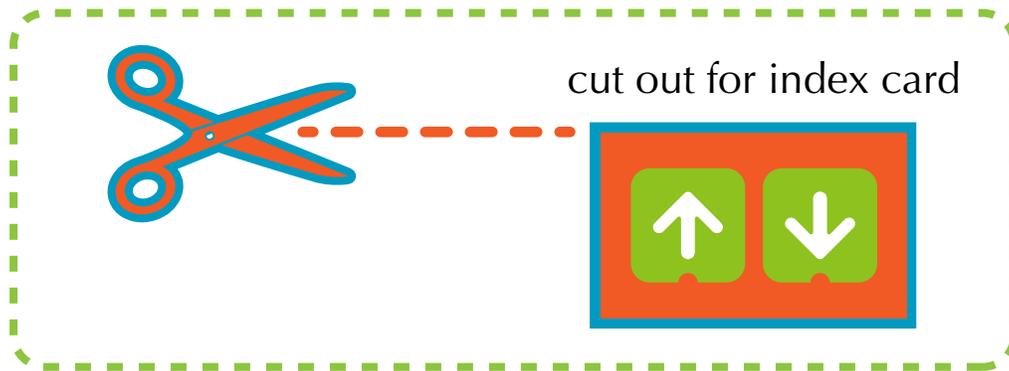
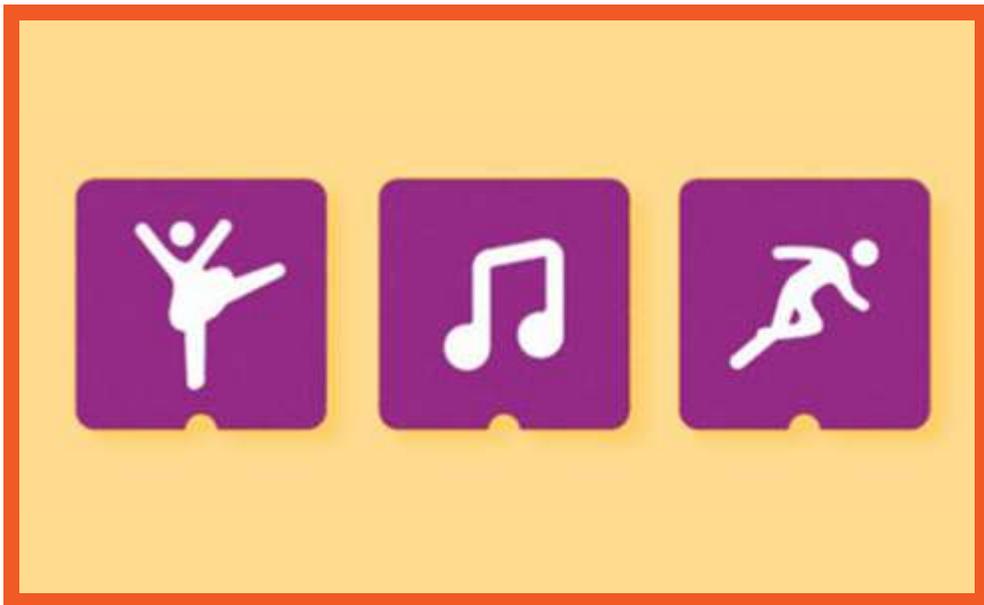## Movement Blocks

Number Blocks
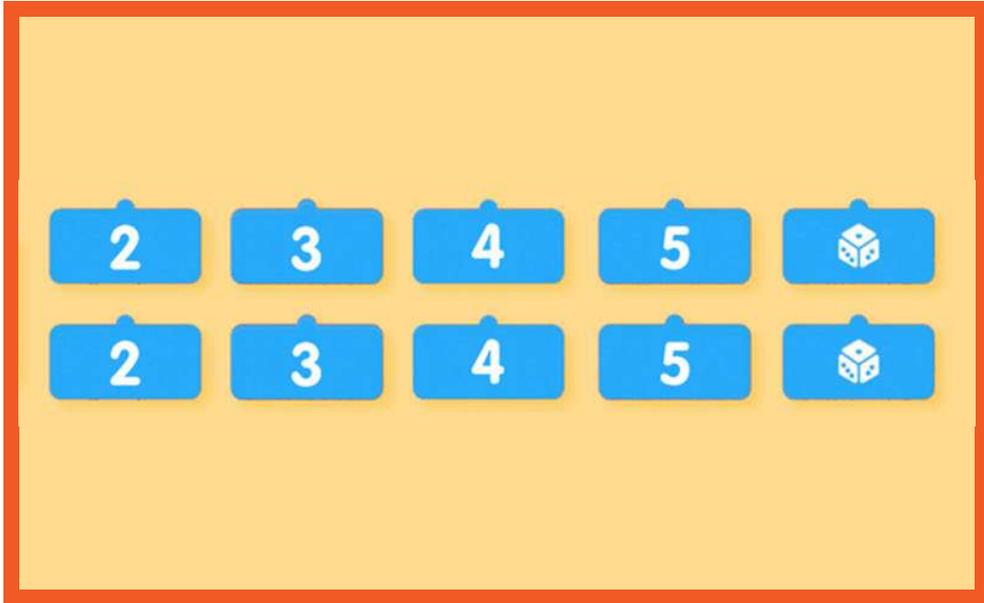
Loops Blocks

Fn or Function Blocks

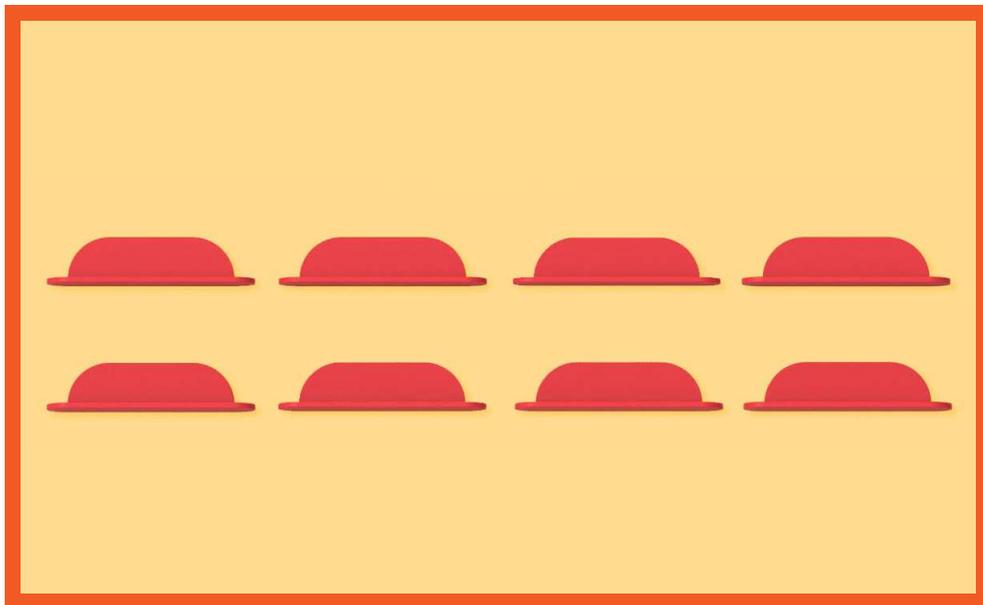## Music, Dancing, Running Blocks

Stand-Up Obstacles

Stand-Up Flags