

Lesson 4

Benchmark I: When mBot Meets a Robot

Overview

Lesson 4 is a reflective learning activity to recap the previous lessons. Students will imagine their story context of the future Robot Society and then create a simple animation to deliver their ideas. First, students will narrate their scenario where an mBot first met with a robot citizen in the future world. Students will then use mBlock to create a dialogue between the mBot and the robot. During this exercise, students need to create simple sequential algorithms to make the sprites talk to each other. This practice will further facilitate their learning of sequencing in the next lesson.

Objectives

By the end of class, students will be able to...

- Recognize and utilize different panels and functions in mBlock while programming;
- Define the sequences of the two (or more) sprites and logically order coding block to generate simple animated effects;
- Select appropriate programming scripts to make an animation illustrating the meeting between mBot and the robot citizen as a demonstration of their imagination and ideas.

Materials

- mBlock
- Lesson 4 Activity Sheet
- Lesson 4 Slideshow

Content Standards

Type	Indicator	Standard
ISTE	1d	Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.
	3c, 3d	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
NGSS	3-5-ETS1-1	Define a simple design problem.
CSTA	1B-CS-01	Describe how internal and external parts of computing devices function to form a system.
	1B-CS-02	Model how computer hardware and software work together as a system to accomplish tasks.
	1B-AP-10	Create programs that include sequences, events, loops, and conditionals.
	1B-AP-11	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.



Pre-lesson Checklist

- Print out and/or digitally distribute the Lesson 4 Activity Sheet.
 - If students will use paper versions of activity sheets, make sure all the resources are easily available for students. This can be done by providing the links on your LMS, etc., or printing the resources out for each group to utilize during the class.
- Make sure any necessary computer equipment is ready to go.
- Familiarize yourself with key points and notes detailed within this lesson plan and Lesson 4 slideshow.



Agenda (60 minutes)

Time Interval	Content
15 minutes	Recap • This phase aims to help review what has been learned in the previous lesson quickly. Students need to recognize and explain the basic concepts in their own words.
25 minutes	Challenge • In this phase, students need to narrate and create their animation project about an mBot meeting with a robot citizen in the future Robot Society.
15 minutes	Share • This phase is to share, peer-review, and reflect upon the tentative animation. Students will evaluate and comment on each other's work.
5 minutes	Clean Up

Activities

Recap: Slides 2-9 [15 minutes]

Objectives:

- This phase aims to review what has been learned in the previous lesson. Students need to recognize and explain the basic concepts in their own words.

Procedures:

Slide 3

- Review the concept of the robot and have students discuss the following question:
 - “What can (and will) the robots do at present and in the (near) future?”*

Slide 4

- Review the concept of programming:
 - Programming is a process of creating a specific order of instructions in code to tell a computer or robot or machine what to do and how to do it.

Slide 5

- Review the construct of the I/O System.

Slide 6

- Review the structure of mBlock:
 - Ask students to point out the three areas in the interface (Stage Area, Blocks Areas, Scripts Area)
 - Ask questions, for example:
 - “If you want to select the ‘ask (...) and wait’ block, where can you find it?”*

Slides 7-9

- Have students recall coding blocks they have learned and used in the previous lessons.
- Ask them to point out the blocks and briefly explain the function.
 - Show Slide 8 to summarize the learned Sensing blocks.
 - Show Slide 9 to summarize the learned Events blocks.
 - Remind students that some of the Events blocks are for sprites in mBlock and some are for mBot.

Challenge: Slides 10-23 [25 minutes]

Objectives:

- In this phase, students need to narrate and create their animation project about an mBot meeting with a robot citizen in the future Robot Society.

Procedures:

Slide 11

- Have students imagine what would happen if an mBot met with a robot citizen in the future Robot Society.
 - Briefly introduce the story context for this project:
 - “Imagine that you and your partners sent a delegation to the future Robot Society.*
 - “mBot on your behalf met with the robot citizens there.*
 - “What would happen?”*

Slides 12-13

- Instruct students to create a narration about this story:

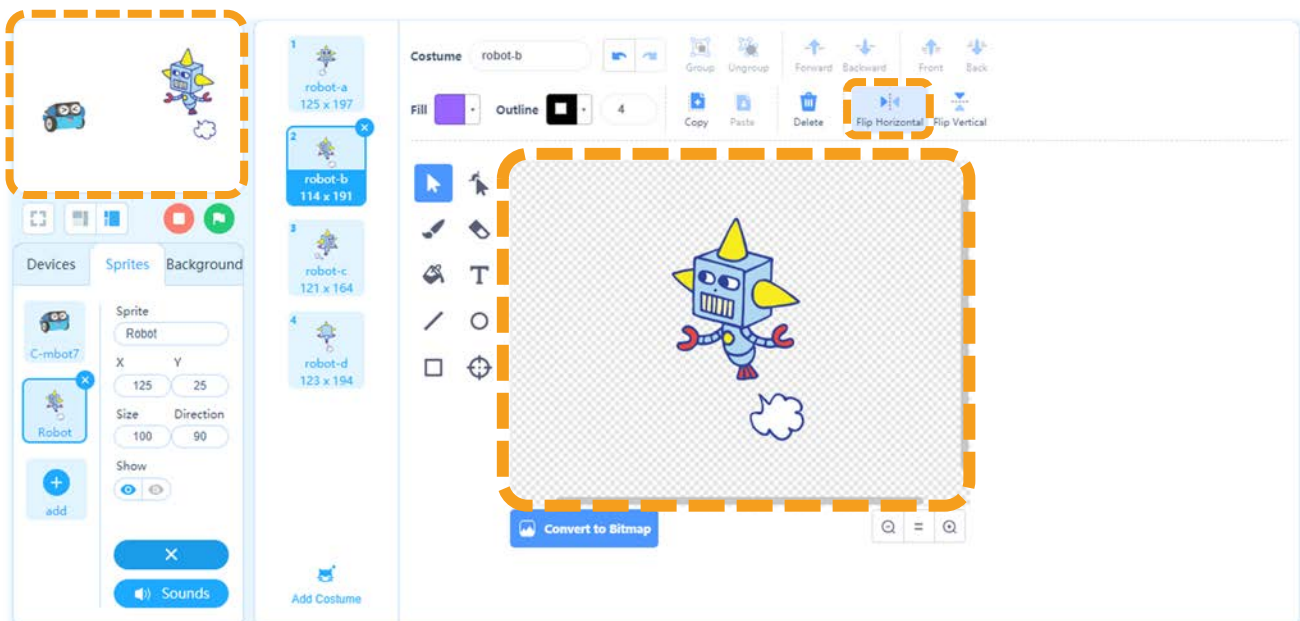
- o “Discuss with your partner(s), outline the story for the animation in the first place – you are welcome to draft this either in a detailed and well-structured format or by doodling the key points.
- o “Translate your story the script into a set of instructions that can be transformed into computer code.
- o “Design the stage by adding relevant character sprites and backdrops (or any interactive effects).
- o “Program the elements you used in the stage – remember to utilize the computing knowledge and skills you have learned in the previous lesson.
- o “Share and present your work with your classmates and tutor(s). Tell them the amazing story you have created.”

Slide 14

- Instruct students to select appropriate coding blocks.
- Ask a question:
 - o “How to change a sprite’s appearance?”

Slides 15-16

- Ask students to solve the direction of a sprite’s costume.
 - o This question is highly related to the previous step of their operation.
 - o Students might find that some of the built-in costumes might not suit their design.
 - o In this case, for instance, the default “C-mBot7” and “Robot” sprites both face the right-hand side. To make the two sprites have a face-to-face chat, students need to flip the costume of “Robot”.
 - o Show Slides 15 and 16 to indicate how to make the sprites face-to-face.



Slides 17-20 (Optional)

- Encourage students to enrich the project by adding a background image.
 - o Ask a question:
 - “How to add a background image in the stage?”
 - o Show Slide 18 to indicate where students can find the “Background” panel.
 - o Show Slide 19 to indicate the Backdrop Library.
 - o Remind students that there exists a kind of Looks block that can switch the backdrop of the stage. It is similar to the “switch costume” blocks.

Slides 21-23 (Optional)

- Encourage students to enrich the project by adding a background image.

- o Show Slide 21 to indicate where students can find the “Sound” panel.
- o Show Slide 22 to show how to operate the “Sound” panel.
 - When clicking on the play button, students can listen to the clip they choose.
 - Besides, they can also add sound clips if they are not satisfied with the default sound clip(s) attached to the sprite.
- o Show Slide 23 to indicate the Sound Library.
- o When necessary, instruct students to use the Sound blocks as well as the built-in Sound Library.
 - Remind them that they can use the sound clips in the Sound Library or record their own sound effects.
- Instruct students to develop and complete their own projects.

Share: Slides 24-26 [15 minutes]

Objectives:

- This phase is to share, peer-review, and reflect upon the tentative animation. Students will evaluate and comment on each other’s work.

Procedures:

Slide 25

- When students complete their projects, ask them to upload the program to the mBlock community and invite peers to play and comment on each other’s work.
 - o Instruct students to use the evaluation form to review their classmates’ projects.

Feedback:

When you complete your project, invite at least one peer to star and comment on your work:

To what degree do you think ...	Guest Score	Self-Score
The design of character sprites looks cool	☆☆☆☆☆☆	☆☆☆☆☆☆
The talk is logically ordered	☆☆☆☆☆☆	☆☆☆☆☆☆
The talk is fun and enjoyable	☆☆☆☆☆☆	☆☆☆☆☆☆
The sprites perform smart and interactive	☆☆☆☆☆☆	☆☆☆☆☆☆

Write a brief description for your project and publish your animation in the mBlock community.

Slide 26

- Remind the class that they need to save their projects either on the local storage or in mBlock as the project completed in this lesson will be reused in the future activity.

Clean Up [5 minutes]