

Comparing Organisms

Lesson Video

Objective: *Students will be able to...*

- Create a program that groups animals by similar characteristics.

Prerequisites

- Computer Science: Students should have experience with events and messages.
- Science: Students should be familiar with identifying the physical characteristics of animals.

Materials & Tools

- [Ready-to-Go Slides](#) or [Teacher-led Slides](#)

Lesson Preparation

- This lesson uses messages to create buttons. Based on your students' familiarity with messages, decide if you need to plan for additional time to review this concept.
- Share the interactive activity with students if they will complete it individually.

Vocabulary

Word	Definition
Event	Something that causes something else to happen in a program
Attributes	Traits or qualities of a plant or animal, like color, size, and texture
Similar	When attributes are alike but not exactly the same
Different	When attributes are not alike

Lesson Agenda

- Review Animal Similarities and Differences (5 mins)
- Introduce the Program and Review Messages (5-10 mins)
- Guided Practice (10-15 mins)
- Independent Practice (10-15 mins)
- Showcase & Closing (5 mins)

Computer Science Explanation
 Event blocks enable characters to communicate and interact with each other. In this lesson, students use messages to create buttons that sort animal characters based on color.



Lesson Details

Review Animal Similarities and Differences (5 mins)

Use the slides to review how animals can be similar and different. If time permits, have students (as a class or in small groups) try to come up with as many similarities and differences as possible. Include some ideas that go beyond physical traits (e.g. what they eat, where they live, etc.)

Introduce the Program and Review Messages (5-10 mins)

Explain that students will create an animal sorter.

- Explain that students will be using two event blocks to create the buttons: the “start on tap” event block and the “when message received” event block.
 - Walk through the process of how the program will use messages to sort the animals by color. Emphasize that the message colors must match because the butterfly will move up only when it receives the yellow message. If the yellow button sends a different colored message, the butterfly will not move.
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Guided Practice (10-15 mins)

Guide students through the process of setting up their program.

- Add the animals: green fish, yellow fish, butterfly, and frog. Add the buttons: Use the draw tools to create a yellow button.
 - Students will now program the yellow button and the yellow animals. Be sure to emphasize that the “send message” and “start on message” colors must match.
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Independent Practice (10-15 mins)

Decide if students are ready to program the green button and animals on their own. If students need more support, you can complete this part of the program with them.

Common Challenges and Questions

Question/Challenge	Answer
My animals aren't moving when they should be.	Check that there is a "send message" block on the button (when TAPPED), and a START ON block on the animal (followed by a move block) and that they are both the same color message.
I am using the Windows/Mac emulator and I can't scroll up to get to my character.	Sometimes the Windows/Mac emulator does not allow scrolling up to previous characters when more than 4 have been added. To access the top characters click and drag in the space to the right of the character boxes.
How do I reset my page?	Click on the blue circle with an arrow next to the green flag.

Extensions

- Add more animal characters.
- Change the movement of the animals.
- Add a background image.
- Draw a 3rd button related to another shared attribute (like size, fur/feathers, number of legs, home)

Closing (5 mins)

Have a few students display their program to the class, and let the class guess which animals will move when the buttons are clicked. Then complete the check for understanding. Engage students in a class discussion on what other types of programs can use buttons.

Resources

Assessment Rubric

Category	4	3	2	1
	Advanced: demonstrates superior performance	Proficiency: demonstrates consistent performance	Moving toward proficiency/expectations	Experiencing significant difficulty
Identify similarities and differences between animals and use events and messages to trigger a character's movement.	Student creates a program that uses events and messages to identify similarities and differences between animals. The program also includes an extension.	Student creates a program that uses events and messages to identify similarities and differences between animals.	Student partially creates a program that uses events and messages to identify animal similarities and differences.	Student needs significant support to create a program that uses events and messages to identify similarities and differences between animals.

Scratch is developed by the Lifelong Kindergarten Group at the MIT Media Lab. See <http://scratch.mit.edu>.