

Name of Unit: Creating a (Gigglebot) Robot Zoo

Title of Lesson: Robot Zoo Introduction to Animal Movement

Overview/Purpose: Students will work in small groups to research an animal and program a Gigglebot to mimic its behavior.

Today's Objective: To work in a group to write programs that mimic a few common animal movements.

Standards (CSTA and MN Academic):

CSTA Standard 1B-AP-10: Create programs that include sequences, events, loops, and conditionals.

MN Science Standard, Grade 3: 3.3.1.1 Developing and using models

<u>Intro</u>	Share the book <i>Zoobots</i> with the students - you can look through the whole book together or choose a few to share today and look at other pages throughout the lesson.	<u>Materials Needed for Lesson:</u> <i>Zoobots: Wild Robots Inspired by Real Animals</i> by Helaine Becker Student Handouts , 1 per group 1 Gigglebot per group 1 Microbit per group 1 MicroUSB to USB per group Chromebooks or computers, at least 1 per group with access to https://makecode.microbit.org/#
<u>Lesson/Activity</u>	Talk about different ways animals can move and why they might do so - connect with science lessons and observations they've made about animals in nature. Explain the Robot Zoo project and that we'll be like the programmers in <i>Zoobots</i> , creating programs for our Gigglebots to act like animals. Demonstrate/work together to write a program with MakeCode to make a Gigglebot run quickly. Give groups time to program and test projects from the student handouts.	
<u>Wrap-up and Next Steps</u>	Pull the group back together and ask how they programmed their robots to jump, swim, and waddle. See if there are groups willing to demonstrate or share the coding blocks they used. Check for frustrations or misunderstandings. Explain that the next step will be having groups choose a specific animal to research and to start creating their animal for our robot zoo game.	<u>Notes:</u> Collect student work and correct to see if students need more time or direction before they start working on their different animals.

Name of Unit: Creating a (Gigglebot) Robot Zoo

Title of Lesson: Robot Zoo, Animal Research

Overview/Purpose: Students will research an animal and program a Gigglebot to mimic its behavior.

Today's Objective: To work in a group to research an animal, which students will use next class to write a program mimicking that animal's behavior.

Standards (CSTA and MN Academic):

MN Science Standards, Grade 3: 3.3.1.1 Developing and using models

<u>Intro</u>	Review last class's work. Refer back to the <i>Zoobots</i> book, specifically the information about the animals that inspired the robots.	<u>Materials Needed for Lesson:</u> <i>Zoobots: Wild Robots Inspired by Real Animals</i> by Helaine Becker Student Handouts , 1 per group
<u>Lesson/Activity</u>	Discuss how animals have adapted in ways to help them survive in their different habitats and to help them avoid being eaten/catch their prey. Brainstorm a list of animals that move in unusual ways. Then give each group time to come up with a list of possible animals they might want to use for their robot zoo project. Make sure each group has a different animal, then give them the new handout and share the resources they can use to research. Tell them to keep their animal a secret from other groups. When the animal research is finished, they can start making the programming plan to figure out how to make their robot behave like their animal.	Animal research resources - books, encyclopedias, and online sources Chromebooks or computers, at least 1 per group Gigglebots & Microbits to start programming when the animal research is complete
<u>Wrap-up and Next Steps</u>	Pull the group back together to summarize their work so far and next steps. Emphasize that they should keep their animal a secret so that other groups can try to guess it when the robot zoo is finished. Collect student work until the next class.	<u>Notes:</u> Print student handouts back-to-back - Part 2 is today's work and Part 3 is for the next step of the project.

Name of Unit: Creating a (Gigglebot) Robot Zoo

Title of Lesson: Robot Zoo, Programming Plan (2-3 classes)

Overview/Purpose: Students will research an animal and program a Gigglebot to mimic its behavior.

Today's Objective: To work in a group to create a program mimicking an animal's behavior, based on the research they did last class.

Standards (CSTA and MN Academic):

CSTA Standards

1B-AP-10: Create programs that include sequences, events, loops, and conditionals.

1B-AP-13: Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.

MN Science Standards

3.3.1.1 Developing and using models

3.3.2.1 Constructing explanations and designing solutions

<u>Intro</u>	Review last class's work. Refer back to the <i>Zoobots</i> book, specifically the information about the ways the robots mimic different animals. At the beginning of the second class, introduce the iterative design process and talk about how important it is to test and revise your work over and over again until you and your group are satisfied with your results.	<u>Materials Needed for Lesson:</u> <i>Zoobots: Wild Robots Inspired by Real Animals</i> by Helaine Becker Student Handouts from previous class 1 Gigglebot per group
<u>Lesson/Activity</u>	Demonstrate/work together as a class to put together a sample programming plan and create a program in MakeCode for an animal no group has chosen. Students will spend almost the entire time working in their groups to create their programming plans, then writing and testing their programs. At the beginning of the second class, demonstrate/work together as a group to revise your plan from the class before.	1 Microbit per group 1 MicroUSB to USB per group Chromebooks or computers, at least 1 per group with access to https://makecode.microbit.org/# Supplies for animal costumes

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<u>Wrap-up and Next Steps</u>	At the end of class, ask students how their groups are doing and how far they are in the process. Ask them what has been going well and what has been frustrating, then see if other groups have advice for them (like dividing up tasks maybe?). Give them 2 or 3 class periods to test and revise their programs and create costumes before running the charade game.	<u>Notes:</u>
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Name of Unit: Creating a (Gigglebot) Robot Zoo**Title of Lesson:** Robot Zoo, Robot Charades**Overview/Purpose:** Students will research an animal and program a Gigglebot to mimic its behavior.**Today's Objective:** For each group to share their work and gather feedback from their peers to modify their projects before our final presentation to families.**Standards (CSTA and MN Academic):**

CSTA Standard 1B-AP-13: Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.

<u>Intro</u>	It's showtime! Explain how the Robot Charades works and give students a few minutes to copy their programs and get their robots ready to go.	<u>Materials Needed for Lesson:</u> Completed student handouts with their animal research 1 Gigglebot per group 1 Microbit per group 1 MicroUSB to USB per group Completed Animal Costumes Chromebooks or computers, at least 1 per group with access to https://makecode.microbit.org/#
<u>Lesson/Activity</u>	During the charades game, the class sits in a circle and groups take turns running their programs. After the program has finished running, the group will call on classmates to try to guess the animal. If they can't get it in 3 guesses, the group shares a clue from their animal research. Guessing continues until the animal is figured out or the class gives up. Then another group presents. *I wish I had allowed time for the rest of the class to give constructive feedback after they guessed the animals, and time for groups to modify their programs and costumes.	
<u>Wrap-up and Next Steps</u>	(What I Did) Have students disassemble their robots and recycle their costumes. Reflect on the work they did, how their groups functioned, and what they learned through the project. Ask if they have suggestions if you taught this lesson next year. (For other projects I've done a Google Form for this or a written reflection - this time we just talked as a class.) (What I Wish I had Done!) Give groups a chance to modify their programs one last time before giving a final presentation at our family night.	<u>Notes:</u> I took photos of each group after they presented their project and a class photo at the end to share with their teachers. We also shared our Robot Zoo at a family night, which was held the week we finished these projects.