

Drive-Bots



Lesson Overview

Students make Drive-Bots and practice revising their robots.

Using only the Drive ACT Cubelet, the Distance SENSE Cubelet, and the Battery, students will assemble the "Cuddle-Bot" and "Fraidy-Bot". Students will investigate how Cubelets robots work by using their hands to control the SENSE block.



Lesson Tags

Grade Level

Preschool & Kindergarten

Difficulty

Apprentice

Duration

30 minutes

Prerequisite Knowledge

Robots are machines that SENSE, THINK, and ACT



Supplies

Cubelets (6 groups of)

1 Distance SENSE
1 Drive ACT
1 Battery

Other Supplies

Anchor Chart Paper
Anchor Chart Markers



Description

Outline

1. Remember Robot is a machine that can SENSE, THINK, and ACT
2. Students build a Drive Bot.
3. Students revise their Drive Bot.
4. Students practice activating the Distance Cubelet.

Objectives

Students will build and revise their first robot, and students will be able to control the Distance Cubelet in their robot construction.

Assessment

Students will demonstrate an understanding of the Distance SENSE Cubelet by controlling their Drive Bot.



Standards

ISTE

- 1.c. With guidance from an educator, students recognize performance feedback from digital tools, make adjustments based on that feedback and use age-appropriate technology to share learning.
- 1.d. With guidance from an educator, students explore a variety of technologies that will help them in their learning and begin to demonstrate an understanding of how knowledge can be transferred between tools.
- 4.1. With guidance from an educator, students ask questions, suggest solutions, test ideas to solve problems and share their learning.
- 4.d. Students demonstrate perseverance when working to complete a challenging task.
- 7.c. With guidance from an educator, students take on different team roles and use age-appropriate technologies to complete projects.

Common Core

NA

NGSS

NA



Vocabulary

Collaborate
Cubelets
Robot
Sense
Think
Act
Battery
Distance
Drive

Toward
Away
Cuddle-Bot
Fraidy-Bot
Dizzy-Bot



Resources

Attachments

NA

Tips & Tricks

- Have the cubelets for each group already at each table - make sure they are *not* connected together yet.
- It is very hard for young children to understand that they control the robot with the black SENSE Cubelet - many students fixate on the ACT Cubelet instead
- Before class, reflect on your students as collaborators. What support will they need to work together successfully today? Possible team roles:
 - Materials Manager
 - Team Leader (in charge of making sure group stays on task)
 - Recorder

Pacing

5 minutes: Introduce learning target and success criteria
20 minutes: Student groups investigate Drive Bots
5 minutes: Wrap up and reflect

Instructional Steps



Step 1 - Pre-class setup

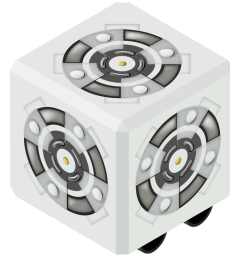
Time: 10 minutes

Cubelets Needed

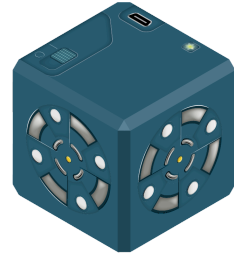
- ❑ Separate Cubelets into 6 groups, each containing:



1 Distance SENSE



1 Drive ACT



1 Battery

Classroom Management

- ❑ Plan 6 student groups (groups should be no more than 4 students, and are best with 2-3).
- ❑ It is wise to start every class with a reminder of the behavior expectations. What are the norms when students are working together? What are the norms when they are discussing as a whole group?



Step 2 - Cultivate Wonder

Time: 5 minutes

Setting the Stage for Today's Learning

"Yesterday we sorted our Cubelets into SENSE, THINK, and ACT groups. We also practiced SENSE and ACT with our game. We're doing this so we can become robot engineers. Does anyone remember what a robot is?"

- [A robot is a machine that can SENSE, THINK, and ACT]

"Today we will be designing our first robots. Are you ready, robot engineers?"



Step 3 - Experience Before Expertise*

Time: 20* minutes - **While students are working, walk around and prompt Co-Constructing Meaning Conversations. See possible questions and sentence stems in the Co-Constructing Meaning section.**

Investigate Drive Bots

"When I say so, you will go back to your table and look with just your eyes at the Cubelets at your table."

- Students go back to their tables.

"How many Cubelets do you have?"

- [3]

"What do you notice about the Cubelets on your table?"

- [SENSE, THINK, and ACT]
- [Battery]
- [Wheels on the Drive Cubelet] -**introduce Drive Cubelet vocabulary**
- ["Eyes" on the Distance Cubelet] -**introduce Distance Cubelet vocabulary**

"Does anyone have a guess about what our robots will do today when we start building?"

- [Move across the table]

"Alright. We're going to have a long time to explore today, so it's very important we take turns and practice being patient. There will be more than enough time for everybody to go. First, your group will need to decide how to build the first robot of the day. After you've put it together, you'll turn on the Battery and try to make it move. Are you ready? Go!"

- Student groups agree on one starter Drive Bot, put it together, and turn on the Battery Cubelet.
- Depending on where the Distance Cubelet is facing, **the robot might not move. THAT'S OK.**

"I noticed some groups have robots that moved right away and some groups that have robots that didn't move at all right away. Can anyone remind me what a robot is again?"

- [A robot is a machine that can SENSE, THINK, and ACT.]

"And when we played Red Light, Green Light, what do we do first: SENSE, THINK, or ACT?"

- [SENSE first, then we THINK, and finally we ACT.]

"Which Cubelet is the SENSE Cubelet today?"

- [Distance Cubelet]

"Everyone, please point at the Distance Cubelet in your robot. Do all the sides of the Distance Cubelet SENSE?"

- [No, just the side with the two little eyes]

"One person in your group - please find the two little eyes of the Distance Cubelet and try to cover that side with your hand."

- [Chaos erupts as all the Cubelet robots begin to move.]
- Students naturally continue to explore their robots.

Notes

- ★ Look for students who are struggling to remember to wave their hand at the SENSE Cubelet.
- ★ Look for groups who may need prompting to remember to rotate the Drive Cubelet different directions.
- ★ Look for groups who may need some prompting to remember to try rotating the Distance Cubelet different directions.
- ★ Ask students to explain how their robot works and why they made the revisions they made.
- ★ Students may need help remembering to be gentle with Cubelets.



Step 4 - Co-Construct Meaning*

Time: – minutes - **This happens while students are investigating with their Drive Bots**

Questions to ask while students work

- "How many Cubelets do you have in your robot?"
- "What does your Drive Bot do?"
- "Where is your Distance Cubelet - what direction is it facing?"
- "Does your robot remind you of anything?"
- "Oh cool! We call that a "Cuddle-Bot"!"
- "Oh cool! We call that a "Fraidy-Bot"!"
- "Oh cool! We call that a "Dizzy-Bot"?"
- Is there another way you could build a robot that does the same thing?
- Have you tried...?
- Have you built any robots that surprised you? What was surprising?
- Have you built any robots that seemed to not work?
- So, what do you know about the Drive Cubelet?
- So, what do you know about the Distance Cubelet?
- Does it matter where the Battery is in your robot construction?
 - Materials Managers put away Cubelets.

Notes

- ☐ Notice which students have the most trouble explaining or describing their robot.
- ☐ Notice which students are most excited to explain or describe their robot.
- ☐ Consider prompts you might use to encourage students to help each other explain and describe their robots.
- ☐ Be mindful of helping students practice using "Distance Cubelet" and "Drive Cubelet" to describe their robot constructions.



Step 5 - Check for Understanding

Time: 5 minutes

Students explain how Drive Bots work

- "Could someone please share one robot your group built today and tell us how it works?"
 - Have several students share out.

Notes

- ☐ Be mindful of helping students practice using "Distance Cubelet" and "Drive Cubelet" to describe their robot constructions.



Differentiation - Intervention & Extension

Time: NA

Intervention

For students who are struggling to understand the Distance SENSE Cubelet. Try assembling a robot for them in a horizontal line like a snake with the Distance Cubelet at the front with its eyes facing "forward" like an animal. Then ask the student to hold their hand in front of its "face". From there, ask them to **only** rotate the Drive ACT Cubelet until they get the hang of it. *Then* they might try to rotate the SENSE Cubelet or move it altogether.

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Extension

Challenge students to come up with as many robots as they can of each type:

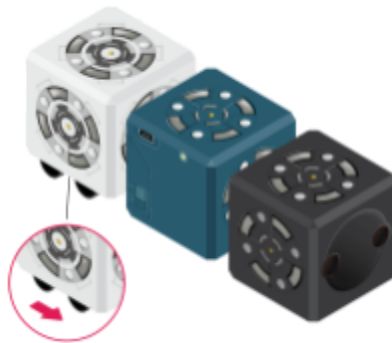
- Fraidy Bot
- Cuddle Bot
- Dizzy Bot

What can they do with the robot if the Drive Cubelet is wheels-up? [Conveyor Belt]

Fraidy Bot



Cuddle Bot



Dizzy Bot

