

# Robot Bodies and Human Bodies, Cubelets Sort



## Lesson Overview

### This lesson reinforces the Battery Cubelet

Early learners will listen to *Boy + Bot* by Ame Dyckman (here is a [youtube read-aloud](#)). Students will practice turning the Battery on and off and talk about what humans and robots have in common, and what makes humans and robots different. Students will then play Red Light, Green Light to practice SENSING and ACTING.



## Lesson Tags

### Grade Level

Preschool & Kindergarten

### Difficulty

Novice

### Duration

30 minutes

### Prerequisite Knowledge

None.



## Supplies

### Cubelets (6 groups of)

1 Brightness SENSE  
1 Flashlight ACT  
1 Battery

### Other Supplies

*Boy + Bot* by Ame Dyckman  
Anchor Chart Paper  
Anchor Chart Markers  
1 green piece of construction paper  
1 red piece of construction paper



## Description

### Outline

1. Teacher reads aloud *Boy + Bot* by Ame Dyckman (here is a [youtube read-aloud](#))
2. Students compare and contrast robots and humans
3. Students practice turning the Battery Cubelet on and off
4. Class plays Red Light, Green Light to practice SENSING and ACTING
5. Students sort Cubelets by job

### Objectives

Students will compare and contrast humans and robots and sort Cubelets by job

### Assessment

All students will demonstrate turning the Battery Cubelet on and off. During class discussion, students will list similarities and differences between robots and humans. Students will accurately sort Cubelets by job.



## Standards

### ISTE

- 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.d. Students demonstrate perseverance when working to complete a challenging task.
- 5.b. With guidance from an educator, students analyze age-appropriate data and look for similarities in order to identify patterns and categories.
- 5.d. Students understand how technology is used to make a task easier or repeatable and can identify real-world examples.

### K12CS

Control - Computers follow precise sequences of instructions that automate tasks. Program execution can also be nonsequential by repeating patterns of instructions and using events to initiate instructions.

Variables - Information in the real world can be represented in computer programs. Programs store and manipulate data, such as numbers, words, colors, and images. The type of data determines the actions and attributes associated with it.

Algorithms - People follow and create processes as part of daily life. Many of these processes can be expressed as algorithms that computers can follow.

### NGSS

K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.



## Vocabulary

Collaborate  
Cubelets  
Robot  
Sense

Think  
Act  
Battery  
Power



## Resources

### Attachments

NA

### Tips & Tricks

- Have the Cubelets for each group already at each table - make sure they are *not* connected together yet.
- 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  
 10 minutes: read aloud and discuss Boy + Bot by Ame Dyckman  
 5 minutes: students practice turning the Battery on and off on a DimBot  
 10 minutes: play Red Light, Green Light  
 10 minutes: students practice sorting their Cubelets  
 5 minutes: closure

# Instructional Steps



## Step 1 - Pre-class setup

Time: 10 minutes

### Cubelets Needed

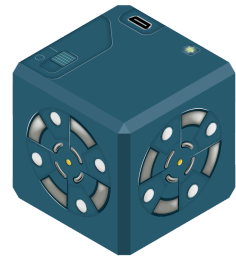
- ❑ Separate Cubelets into 6 groups, each containing:



1 Brightness SENSE



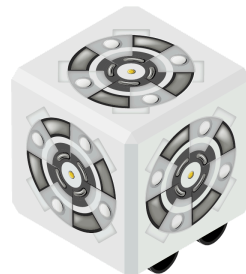
1 Distance SENSE



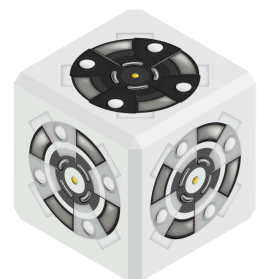
1 Battery



1 Flashlight ACT



1 Drive ACT



1 Rotate ACT

### 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 listening to read-aloud or discussing as a whole group?
- ❑ **For Red Light, Green Light:** What gesture will represent students "turning on their Battery"? You might write the words "Red" and "Green" on the construction paper.
  - ❑ **Where will you play Red Light, Green Light?** Do you have space in your room? How can you make space?



## Step 2 - Cultivate Wonder

Time: 10 minutes

### Boy + Bot by Amy Dyckman

*"Yesterday we played with Cubelets with just our imagination. When you build with Cubelets you are making a robot. Does anyone remember what a robot is?"*

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

*"Today we will be reading a story about a boy and a robot. As we read, think about what is the same between the boy and the robot, and what makes them different"*

- Read aloud [Boy + Bot](#) by Amy Dyckman or watch this [Youtube Read Aloud](#).

Choose questions appropriate to your students:

*"What did you notice in the story?"*

*"What did the Boy and the Robot have in common?"*

*"What makes you think that?"*

*"What was different between the Boy and the Robot?"*

*"What makes you think that?"*

*"Robots need power, but humans do not. What do humans need to have energy?"*



## Step 3 - Experience Before Expertise

Time: 5 minutes

### Understanding Power, and remembering Sense and Act

*"Today, we read Boy+Bot by Amy Dyckman and we talked about what robots and humans have in common - and what makes them different. Now you've had the chance to play with some robots. What do Cubelets robots have in common with the robot from Boy+Bot? What makes them different?"*

- [possible responses:
  - **Similarities:** Bot had a power switch and Cubelets have a power switch.
    - Bot had a Battery pack, and Cubelets have a Battery Cubelet
    - Bot's eyes light up when he's "on". The DimBot lights up. And when the Cubelets are all attached to the Battery, they all have little green lights.
  - **Differences:** Bot needed oil, but Cubelets don't need oil.
    - Cubelets need to charge the Battery- but we don't just trade out the batteries. We always use the same Battery.
    - Bot looks like a human, but Cubelets don't.
    - Bot can't get taken apart and turned around, but Cubelets can.

*"Who can remember what is a robot?"*

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

*"Now we're going to play a game that will help you act like a robot. It's called Red Light, Green Light and the rules are simple.*

*First, you're all going to stand in a line on one side of the room and I'll stand on the other side.*

*Then when we're all ready, we'll turn on our batteries [choose a gesture to represent this, like tapping your nose, or sliding on hand up your side like a zipper].*

*Once you're on, you'll first need to SENSE whether I'm holding up a Green Light or a Red Light [Show students what each looks like - a plain piece of red construction paper and green construction paper will be plenty]. If you SENSE a Green Light, you will move forward like a robot. If you SENSE a Red Light, you will freeze. The goal is to be the robot that uses their SENSE best. Any questions?"*

- Answer questions, then dismiss students to stand at one end of the room.
- Play Red Light, Green Light for the rest of class.

### Notes

- ★ Look for which students are rotating a single block vs. reorganizing the robot. Do you have any students who change the robot from a tower to a snake? Do you have any students who make a robot that's not just Cubelets in a straight line?
- ★ Students may need help remembering to be gentle with Cubelets.



## Step 4 - Co-Construct Meaning

Time: 10 minutes

### Group Practice Sorting Cubelets & Turning on Battery

*"When I say so, you will go back to your table and try to remember which Cubelet is the one that powers the robot. When your group has found it, everyone in your group needs to put one finger on that Cubelet, and the other hand on top of their heads."*

- Students go back to their tables, find Battery

*"I'd like every group to please attach three of their Cubelets together. Remember how important it is to make sure everyone has a chance to share their ideas."*

- Groups attach Cubelets together

*"Does anyone remember how to turn the Battery on and off? Let's all practice."*

*"How do you know when the Battery is on without looking at the Battery?"*

- [When the Battery is on, green lights blink on all the Cubelets and the Act Cubelets might do something. When the Battery is off, there are no lights.]

*"Please take turns. First, please make sure the Battery is off. Then one person in the group, rearrange the Cubelets in your robot construction. You might turn one around or put them in a different order. When you've chosen how you want them to be put together, turn on the Battery and see what it does. After your group has seen what you built, pass your Cubelet construction to the next person in the group. Try really hard to not make the same exact robot twice!"*

- Students take turns modifying the DimBot by rotating a single Cubelet or putting the Cubelets in different orientations.

*"Now, I'd like every group to please try to sort your Cubelets. Try to have only 3 groups when you're done."*

- Groups sort Cubelets.
- TEACHER NOTE: Notice whether students are sorting by color or by a different variable. Eventually we want every group to sort by color. Notice also whether groups are putting the Battery Cubelet in its own group. *This is correct. The Battery should be alone in the third group.*

### Notes

- ☐ For the discussion, project a picture of Boy+Bot to remind students what Bot looked like.
- ☐ Some of the discussion may repeat some information from the first discussion.
- ☐ Students may need more specific directions on how a robot might move.
- ☐ Start with a practice round of Red Light, Green Light to decrease anxiety for some students.



## Step 5 - Check for Understanding

Time: 5 minutes

### Whole Class Review

*"How did your group work together today? Do you have anyone you want to celebrate or thank in your group?"*

- Students share out.

*"What did you learn about Cubelets today? What is your favorite part so far? Is there anything you wish you already knew?"*

- Students share out.

*"What did you feel while we were playing Red Light, Green Light? Did you ever feel your brain thinking to figure out whether to go or stop? What did it feel like when you accidentally moved on a Red Light or forgot to move on a Green Light?"*

- Students share out.

Materials Managers put away Cubelets.



## Differentiation - Intervention & Extension

Time: NA

### Intervention

Based on how students played with Cubelets on the Open Play day, you may have some groups assemble their DimBots together. But for some groups, you might have their DimBots already assembled. Keep an eye on groups who may struggle to revise their robots. This is a very challenging ask for young learners.

For students who are struggling to sort the blocks, ask them to sort *by color* right away. You may also give them a hint that the Battery is in a category by itself.

### Extension

Challenge students by asking them to describe their sorted Cubelets by something else that's not color. If time permits, ask them to sort their blocks in a different way.

You may choose to ask students to think about what other THINK Cubelets might exist.