

Interrupting Robot

Summary

Description

Dash wants to tell you a robot knock-knock joke. It's a robot version of the Interrupting Cow joke. Have you heard that one before?

Knock, knock.

Who's there?

Interrupting cow!

Interrupt-

Moo!

Learning Procedure

Your students will giggle and hoot with laughter as they program Dash to perform this silly knock-knock joke. Students will work in pairs or trios to add onto a program over the course of **3 challenges**. In the same way two people converse with each other, students will program the **Wait for** command to cue Dash to **Hear Voice** and respond by **Turn to Voice** or **Look Towards Voice** before speaking.

Concepts Covered

- **Start** - students will learn to initiate a program by tapping the **Start** button.
- **Adding block commands** - students will learn to drag and drop blocks to an existing program
- **Wait for** - students will learn to program the **Wait for** block with a condition that cues a command, e.g., **Hear Voice**.
- **Drive** - students will learn to program **Turn to Voice**, so Dash will appear to respond to the speaker after hearing a voice.
- **Sound Activation** - students will learn to program Dash to **Turn** or **Look** in the **direction of sound**
- **Recording Sound** - students will **record** and program original sounds in the **My sounds** recorder.
- **Sound Bank** - students will use the menu the **Say** block to add a **pre-programmed sound**, e.g., **Ai Yai Yai**.

In App

Vocabulary

- **Control:** to use power to manage or command
- **Drive:** to control the movement or direct the course of Dash
- **Light:** a form of energy that makes it possible for the eye to see
- **Look:** to face a certain direction
- **Sensors:** a device that detects and responds to changes within the environment
- **Sounds:** anything that can be heard by your ears
- **Start:** the beginning of or to begin the program that was created
- **Wait for:** putting a hold on the program until a new cue or command is introduced

Reflection Questions

1. Research the parts of the human ear. How are messages we hear delivered to the brain? How is this sequence same or different than a coded program? How does the human ear compare to a robot's sensors?
2. How does the proximity of sound affect the robot's ability to complete the commands in the program? Measure the farthest distance in cm. that Dash can sense sound.
3. Change the condition in the **Wait for** command, e.g., clap, pick up, obstacle in front. How does this change the Interrupting Robot program?
4. If you were to program Dash to navigate through a maze, which type of **Wait for** cue would work best: clap, pick up, hear voice, obstacle in front? Explain why.
5. Identify devices around your home that are sound activated (speech to text function on computer, Siri on iPhone/iPad, GPS). What other types of technologies found around your home could be improved by sound activation? Explain how.

Activity Extensions

Nutty Knock-Knocks

Ask students to brainstorm other silly jokes for Dash to share. Challenge students to program Dash to tell one of their favorite knock-knock jokes. Visit funology.com for other kid-friendly jokes. <http://www.funology.com/knock-knock-jokes-page-4/>

Dashing Duo

Ask your students to write a comedy script to perform with their comic pal, Dash. They should include 3-4 original jokes, at least, 1 pre-programmed sound and 2 or more

recorded sounds. Encourage students to use silly accents and funny sound effects, too.
*Remind students to speak clearly, using dramatic expression in their recordings.

Dandy Director

Have students write and direct a scene for a new TV comedy in which Dash is the daring hero. In this scene, Dash comes to the rescue. Include the setting, the problem and character descriptions. Have students visit the My sound bank, to view the menu of pre-programmed sounds. Students should also record their own sounds and dialogue. Remind students to make their scene funny. After all, this is a comedy. Afterward, students should program the same scene in the "Create New" section of the Blockly App. Their program must include each of the following commands: wait for, look to voice, turn towards voice, as well as recorded and pre-programmed sounds.

Sound Scientist

Now it's your students' turn to test their own hearing sensors. Challenge students to determine the direction a sound is coming from. Have students work with a buddy to test each other. While one student is blindfolded their partner makes a series of noises to the left, right, front or behind. Can the blindfolded partner locate the direction of the sound? Have partners record their data in a table to share with the class. After: Visit the *Highlights* website to learn how to make "Mirror Ears" that trick your ears.
<https://www.highlightskids.com/science-experiment/turn-sounds-around>

Solutions

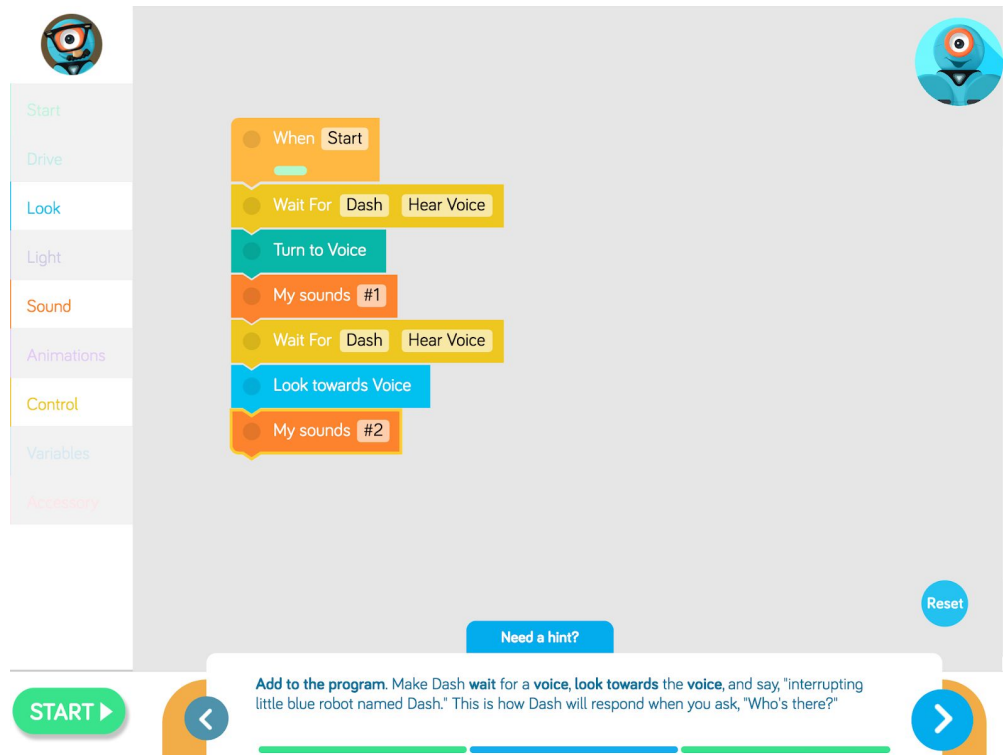
Challenge 1

Add blocks to make Dash **wait for** you to speak and then **turn to your voice**. Then make Dash say, "Knock-knock." Tap **Start** and then say, "Tell me a joke," to get Dash's attention.

The screenshot shows the Dash Blockly programming environment. On the left is a category menu with options: Start, Drive, Look, Light, Sound, Animations, Control, Variables, and Accessory. The main workspace contains a script with four blocks: 'When Start', 'Wait For Dash Hear Voice', 'Turn to Voice', and 'My sounds #1'. A 'Reset' button is in the bottom right of the workspace. A 'Need a hint?' button is centered below the workspace. At the bottom, a hint box contains the text: 'Add blocks to make Dash wait for you to speak and then turn to your voice. Then make Dash say "knock knock." Tap Start and then say "Tell me a joke" to get Dash's attention.' A 'START' button is on the left, and navigation arrows are on the right.

Challenge 2

Add to the program. Make Dash **wait** for a **voice**, **look towards** the **voice** and say, "Interrupting little blue robot named Dash." This is how Dash will respond when you ask, "Who's there?"



When Start

Wait For Dash Hear Voice

Turn to Voice

My sounds #1

Wait For Dash Hear Voice

Look towards Voice

My sounds #2

Reset

Need a hint?

START ▶

◀ ▶

Add to the program. Make Dash wait for a voice, look towards the voice, and say, "Interrupting little blue robot named Dash." This is how Dash will respond when you ask, "Who's there?"

Challenge 3

Now it's time to make Dash interrupt you! Program Dash to **wait for** a voice, **look towards** the **voice** and make **Ay Yai Yai** sound. Push **Start**. Dash should interrupt you during the joke!

The image shows a block editor interface for programming a Dash robot. On the left is a sidebar with categories: Start, Drive, Look, Light, Sound, Animations, Control, Variables, and Accessories. The main workspace contains the following code blocks:

- When Start (orange)
- Wait For Dash Hear Voice (yellow)
- Turn to Voice (teal)
- My sounds #1 (orange)
- Wait For Dash Hear Voice (yellow)
- Look towards Voice (blue)
- My sounds #2 (orange)
- Wait For Dash Hear Voice (yellow)
- Look towards Voice (blue)
- Weird Ay Yai Yai (orange)

At the bottom, there is a 'START' button, a 'Need a hint?' button, and a 'Reset' button. A progress bar at the very bottom shows the current step in a sequence of three steps.

Now it's time to make Dash interrupt you! Program Dash to **wait for** a voice, **look towards** the **voice**, and make the **Ay Yai Yai** sound. Push **Start**. Dash should interrupt you during the joke!

Educational Standards

CC Mathematical Practices:

1, 2, 4, 5, 6, 7, 8

CC Language Arts Standards

RI.2.5; R1.2.10; RI.3.4; RI.3.10; RI.4.4; RI.4.10; RI.5.4; R1.5.10

CSTA K-12 Computer Science Standards

- 1A-DA-05 Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.
- 1A-AP-08 Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.
- 1A-AP-10 Develop programs with sequences and simple loops, to express ideas or address a problem.
- 1A-AP-11 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
- 1B-AP-08 Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
- 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.
- 1B-AP-12 Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.

NGSS Science and Engineering Practices

- K-2-PS3-2 - Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.
- 4-LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. *Applies to Sound Scientist in Activity Extensions.