



The Sound Of CS

Focus: Programming and Sound

Standards:

Primary Objectives:

- Students will learn how to write a program to tell a story.
- Students will learn how to use text-to-speech to narrate a story.
- Students will learn how to use conditionals.

Secondary Objectives:

- Students will become familiar with the Kano World platform.
- Students will learn how headphones, speakers, and microphones work.

Resources:

School	TECH CORPS	Instructor/Volunteer
Computers with Google Chrome	N/A	N/A

Planning Notes:

- Please make sure that you are familiar with Kano World by going through the lesson plan and activity document prior to facilitation. There are many different ways to accomplish the goals of this lesson in the platform.
- Feel free to let students change and create as they feel. This lesson is structured to help prepare students to create their own story, but there are benefits to letting students work freely as they follow along.
- Please make sure that Kano World is accessible prior to arriving for your lesson. Kano World is a free, online platform for students to use drag and drop coding, similar to Scratch.
- It is recommended that students work in pairs for the activity. Pair programming is a technique in which one student writes code, while the other student observes, constantly checking for mistakes. The two partners switch roles frequently. Pair programming adds the benefit that errors can be caught and fixed early in the development process.

Activity:

1. Introduction
 - a. Begin by asking students what they know about speakers. A speaker is any device that changes electrical signals into sounds loud enough to be heard at a distance.
 - b. Speakers use electrical signals to move a coil, or wound piece of metal, along a magnet. This causes variations in air pressure that moves a paper cone, making sound waves.
 - c. Microphones work the same as speakers, but in reverse!
 - d. For more information or to dive deeper into the inter-workings of speakers, a link is provided in the supplemental resources section of this lesson.



- e. Text-to-Speech uses character recognition to put together different sounds to create words and phrases. We will be exploring text-to-speech as a narration tool later in this activity!
2. Computer Science
 - a. Show students the Poppie Simmonds video in the supplemental resources section of this lesson.
 - b. The video details the story of Poppie Simmonds, a computer science student and her day-to-day habits as a programmer.
 - c. Students will be writing and telling their own story similar to Poppie later in this activity.
3. Kano
 - a. Introduce students to the Kano World platform.
 - b. Note: It is always a good idea to repeat yourself several times at several occasions on important concepts or terms. Be sure to highlight that students are programmers writing algorithms, or a list of instructions, in Kano's language.
 - c. Using the *Sound of CS* activity document as a guide, allow students to follow along as they create their own story on Kano World.
 - d. During the activity, each time a change is made to the code, student's computers will begin the story. To avoid unnecessary noise, students may right click the **Text-To-Speech: say** blocks and select "Disable Block". To test their code, they will need to right click each **Text-To-Speech: say** block and click "Enable Block".
4. Debrief and Presentation
 - a. If time permits, allow students to present out the stories that they created.
 - b. When students have finished presenting, highlight each of the different technologies that students have worked with (i.e. text-to-speech, programming, speakers, etc.).

Supplemental Resources:

- Headphones and Speakers: <https://www.allaboutcircuits.com/technical-articles/introduction-audio-electronics-sound-microphones-speakers-amplifiers/>
- Poppie Simmonds: https://www.youtube.com/watch?v=gM_rxFRWbUk
- Kano World: World.Kano.me