

Assistive Device Teacher Guide

Overview

Investigate some of the challenges faced in an emergency situation by an individual who has experienced some or a complete loss of hearing. Create a technological solution to help this individual, using a Sphero robot and OrbBasic programming software.

The design criteria have been outlined on the student worksheet. Students may complete one or several stages of robot behavior based on interest, programming ability, and time allotted.

Estimated Time: 1.5 - 2 hours

Student Organization:



Objectives

- Think critically about a real-world problem that can be addressed with a technological solution.
- Determine criteria for the development and evaluation of a technological solution to the problem.
- Create an OrbBasic program for Sphero that meets the criteria. (Optional: Instructors or students may choose to use MacroLab.)
- Demonstrate and explain the reasoning behind and process to develop and test your design.

Materials Needed

- Large chart paper and markers
- Sample Program
- Student Worksheet

FAQs:

Q: How can students get familiar with the needs of someone who is deaf, deafened, or hard of hearing?

- Provide students with time to research the needs of someone who is deaf, deafened, or hard of hearing and the kinds of technology they use in everyday life.
- Encourage students to research innovative solutions being developed for individuals who are hard of hearing and to look for these solutions being applied (or not) in their own communities. Many companies and organizations are involved in researching and creating assistive devices and apps to improve the lives of individuals with specialized needs. These may be found in online technical magazines, journals, newspapers, or shared on blogs by individuals who have those needs.
- Encourage students to interview a neighbor, relative, or community member, who has experienced hearing loss, or who is deaf or hard of hearing, about their needs and concerns in an emergency situation.

Q: Where can my students find more information about the needs and concerns of individuals who are deaf, deafened, or hard of hearing?

A few starting points for investigation:

- National Association for the Deaf
 - Emergency Preparedness Information (<http://nad.org/issues/emergency-preparedness>)
 - State Association Affiliates (<http://nad.org/community/state-association-affiliates>)
- Hearing Loss Association of America (<http://www.hearingloss.org/>)

Q: What kinds of programs can students create?

It is a good idea to start with a simple program and then build in complexity as time allows. For example, students may start with a program that changes the Sphero's glow color at timed intervals, and then proceed to make those colors flash, and then add movement. Printed comments can also be added throughout to describe what the stage of emergency has been reached and display messages in the output of the OrbBasic app.

Extension:

- Conceive and design (e.g., sketches or prototypes as time allows) a triggering mechanism to start the program you have created.
- Consider another individual in this emergency situation who would benefit from an assistive device. What is challenging about the situation? How would this individual's needs be different if they were unable to see or if they had limited mobility? How could you modify your program or approach to support this individual? Modify your OrbBasic program or approach to support this individual in some way.
- Consider a different emergency situation (e.g., an earthquake). How would individual needs and challenges be different in this situation? How would the design need to change?