

Engineering, L1: Making Sense of the iPhone Sensors

Subject Area(s) science & technology
Associated Unit Engineering
Lesson Title Making Sense of the iPhone Sensors

Image 1

ADA Description: Image showing Apple iPhones
Caption: Image 1. Apple iPhones
Image file name: iphone.gif
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Grade Level 7 (6-8)
Lesson # 1 of 10
Lesson Dependency None
Time Required 20 minutes

Summary

Students are introduced with a description of electromechanical sensors and comparison of human sensors is examined. Students will compare parts of the human body such as the eyes, skin, and ears with electromechanical sensors such as light, sound, and touch. Students will consider the Apple iPhone and investigate the special sensors it uses. Sensors are all around us in our everyday lives. The goal of this lesson is that students become more aware of the type of sensors that exist and how they are engineered.

Engineering Connection

Sensors are all around us. Engineers from different disciplines collaborate to create wonderful inventions to make our lives easier and fun. A team of computer, electrical, mechanical, chemical and communication engineers worked together to invent the iPhone. Engineers make use of science, math and technology to bring their inventive visions to life.

Engineering Category

Keywords

Engineering, computers, sensors, robotics

Educational Standards

- ISTE 1. Creativity and Innovation
- ISTE 3. Research and Information Fluency
- ISTE 6. Technology Operations and Concepts

Pre-Requisite Knowledge



Learning Objectives

After this lesson, students should be able to:

- Discuss various sensors found in the Apple iPhone.
- Explain how some of the sensors in the iPhone work by relating science, mathematical and technology concepts.
- List the type of engineering disciplines involved in designing the iPhone

Introduction / Motivation

Lesson Background & Concepts for Teachers

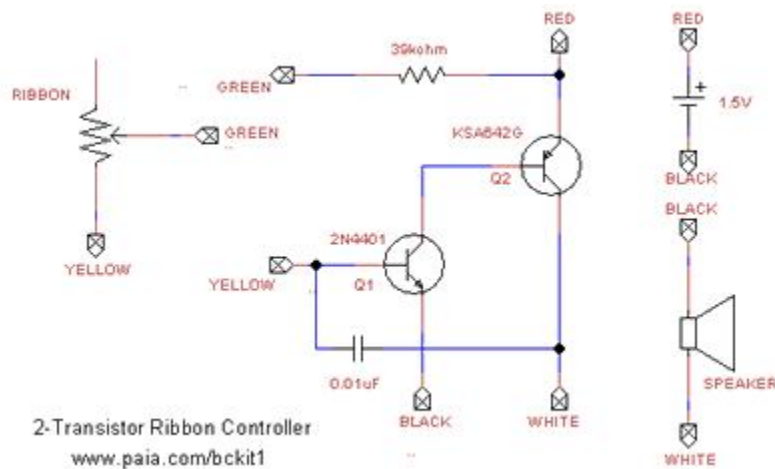


Figure 1.

Figure #1

ADA Description: Theremin schematic

Caption: Figure #1

Image file name: 2transistorribbonkit.jpg

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Vocabulary / Definitions

Word	Definition
Sensor	A device that measures a physical quantity and converts it into a signal that can be read by an instrument
Electrical current	A rate of electric charge
Resistor	A component that resists the flow of electrical energy
Capacitor	A component that stores energy

Associated Activities

Students will construct and perform investigations on the Theremin Project. PAiA, the electronics kit creator beloved by music DIYers, has a fantastic, simple kit that's likely to appeal to beginners and kit lovers alike. The kit is a "2-Transistor Ribbon Kit," and it's the basic circuit

for ribbon controllers for music, of the sort found in commercial products like Kurzweil keyboards and invented by Paul Tanner as the “Tanner-in” — the same instrument used in the Beach Boys’ “Good Vibrations.

Lesson Closure

Students will share their observations and ideas to improve the performance of the Theremin. Sensors are all around us. Can you invent a sensor? Take a stroll. How many sensors do you encounter? Report back to class with your observations.

Assessment

Students will complete the Capacitor Quiz. See document file: capacitorquiz.doc

Students will formulate ideas and improvements for the Theremin Project

Lesson Extension Activities

See document file: Thereminkit.doc

Additional Multimedia Support

References

<http://www.Paia.com>

<http://electronics.howstuffworks.com/iphone.htm/printable>

<http://www.apple.com>

Other

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