CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

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Project Number

38042

Project Title

Blocking RFID Readers

Abstract

Objectives/Goals

The objective of this project is to determine which metal blocks RFID reader from reading RFID tag the best.

Methods/Materials

I first downloaded Serial Terminal Emulator software and the Parallax RFID drivers on my computer. I glued 2 acrylic tubes to each of two acrylic plates. I used a powered metal shear to cut each metal sheet to a size of 8.5 cm x 5.5 cm. I screwed the RFID reader to one set of tubes, and I mounted the RFID card on the other set. I used rubber bands to attach the copper sheet to setup with RFID card. I taped a ruler to my work surface and moved the setup with the RFID reader to 0 cm mark. Starting from 1 cm away, I moved the setup with the RFID card and metal back until the card couldn't be read. I recorded the maximum distance the card could be read at, in cm. I repeated this with other metals (brass, silver, nickel, stainless steel, control). I recorded data and analyzed it.

Results

I observed that with copper, the mean distance was a about 4.6 times the control. With brass, the mean distance was about 3.4 times the control. With nickel, the mean distance was about 2.7 times the control. With stainless steel, the mean distance was about 2 times the control. With silver, the distance was about 1.6 times the control. Results show that copper blocked RFID reader from reading RFID tag the best, followed by brass, followed by nickel, followed by stainless steel, followed by silver, and the control.

Conclusions/Discussion

In conclusion, my hypothesis was correct. Copper did block the RFID reader from reading a tag the best. This is most likely due to the absorption of the electromagnetic waves by the copper sheet.

Summary Statement

I showed that all the metals I tested had a blocking effect on the electromagnetic waves emitted from the RFID reader.

Help Received

My dad supervised me while using the powered metal sheer, and my mom helped me purchase supplies.