



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

Name(s) John W. Merwin	Project Number 38052
Project Title Glove-Mounted Bell: Wearable Device for Producing Audible Alert while Bicycling or Doing Other Activities	
Objectives/Goals To study if a glove-mounted audible alert device could make cycling safer. To determine if a glove-mounted device is easier to use than a traditional bike bell because it does not require the user to remove or reposition the hand on the bike handlebar. A secondary goal was to determine if a similar device had already been invented. Abstract The device is a bicycle glove that has copper pieces added to the thumb and middle finger. A wire runs from each of the copper pads to an electronic, sound-producing device mounted on the back of a glove. The electronic device is powered by a battery. To use the glove, the rider can keep their hand on the handlebar. When the rider touches his/her middle finger and thumb together, it produces an audible alert. Tests compared the device to a traditional handlebar mounted bicycle bell. The first test measured the ability to stay on a straight line while ringing each type of bell. The second test measured rider turning abilities through a slalom course while ringing each type of bell. Methods/Materials The device is a bicycle glove that has copper pieces added to the thumb and middle finger. A wire runs from each of the copper pads to an electronic, sound-producing device mounted on the back of a glove. The electronic device is powered by a battery. To use the glove, the rider can keep their hand on the handlebar. When the rider touches his/her middle finger and thumb together, it produces an audible alert. Results Test one: The average number of times that the rider went off the line was 1.5 for the glove-mounted audible device vs. 2.9 for the traditional bike bell. The average amount of times the rider was able to ring the glove-mounted audible device was 10.9 vs. 6.9 for the traditional bike bell. Test two: The average number of missed cones on the slalom course of 11 cones was 0.7 for the glove-mounted audible device vs. 2.7 for the traditional bike bell. The average amount of times the rider was able to ring the glove-mounted audible device was 33.2 vs. 25.0 for the traditional bike bell. Conclusions/Discussion The results support the hypothesis that if a bicycle rider uses the glove-mounted audible alert device then the rider would be safer than if they use a traditional handlebar-mounted bell to alert fellow travelers of their position. The glove-mounted device required less repositioning of the hand so the riders were able to stay on course and ring the glove-mounted bell more often. Riders reported it felt more comfortable to touch the fingers together to ring the bell. A provisional patent was filed for this device after research concluded that a similar device had not been patented.	
Summary Statement I designed and built a glove-mounted audible alert device, tested it against a traditional bike bell and showed that the glove-mounted device performed better in bicycle riding tests.	
Help Received I came up with the idea, made the device, conducted the tests and analyzed the results. My parents helped me buy the parts and they helped me file the provisional patent. They helped me organize the information I wanted to present.	