CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
J0106

Project Title
Fins, Flippers, Feet!

Abstract

Objectives/Goals
What type of webbed foot will propel a bird the fastest in the water? I predict that the foot with the most webbing between each toe will move a water fowl the fastest because it has the most surface area to create force against the water.

Methods/Materials
The first part of the procedure was the speed testing. The swimmer swam 3 laps in the lap pool using each kind of the different fins. The control used no fins, the other trials used full fins and semi fins. For each trial, timing took place when the swimmer left the wall, and it ended when the swimmer reached the wall on the other side of the pool. The second part was the force testing. Each of the different fins was tested three times. For each type of fin, a string was attached to the fin and a hanging scale. The fin was pulled through the water to measure the resistance of the fin design.

Results
The fin with the most surface area, the full fin, produced the fastest swimming time. It had the most surface area to push the water. The second fastest time was the semi fins, followed by non swimming bird fins, and lastly no fins. With the force testing, the semi fin had the most amount of resistance followed by the non swimming fin. The least amount of resistance was the full fin.

Conclusions/Discussion
The foot with the most webbing had the most surface area. In the swimming test, the full webbed foot swam the fastest. In the force test, the full webbed foot took the least force to get through the water. The foot with the most webbing produced the best result because it was able to move the most amount of water while using the least amount of force. This information helps us understand the adaptations of bird feet and what designs are best for swimming birds.

Summary Statement
Using swimming fins to simulate bird feet, test what type of fin will propel a bird the fastest in the water.

Help Received
My Dad helped by swimming laps and I timed him. I designed the experiment, the fins, and did the rest.