



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

**Your Name** (List all student names if multiple authors.)

**Isaac A. Rubin**

**Science Fair Use Only**

**J0932**

**Project Title** (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

**Zoom Zoom Zoom!**

**Division**

**J Junior (6-8) J Senior (9-12)**

**Preferred Category** (See page 5 for descriptions.)

**9 - Fluid Mechanics/ Aerodynamics/ Thermophysics**

**Abstract** (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

**Objective:** My project was to determine the best-sized propeller for a small under water vehicle. I believed that the large boat propeller would create the most thrust. The large boat propeller would displace the most water per revolution, but the work required will probably cause the motor to turn slower. In combination with the motor used, it will be able to use the power given the most effectively.

**Materials and Methods:** Four different sizes and shaped propellers were tested under water for the most thrust in newtons per watt. Three boat propellers ranging in size from 35mm to 55mm, and a 60 mm airplane propeller were tested. The water depth, test apparatus, power supply, and motor remained the same throughout the experiment.

**Results:** The 55mm boat propeller consistently displayed the highest newtons of thrust per watt for this size motor. The shape of the propeller is important because the 35mm boat propeller performed better than the 60mm airplane propeller.

**Conclusion:** My conclusion is that size and shape of underwater propellers play an important role in thrust per watt.

**Summary Statement** (In one sentence, state what your project is about.)

I built a test rig that allowed me to measure and compare the thrust/watt of small propellers underwater.

**Help Received in Doing Project** (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Monterey Bay Aquarium let me use workshop space, a balance and an amp meter. My dad showed me how to measure amps and volts, and helped hold things during the experiment.