California Science Center

CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

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

Ashley D. Glosz

Science Fair Use Only

J0910

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

Which Materials Conduct Ultrasonic Sound Best Underwater?

Division

X **Junior (6-8)** _ **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 objective was to determine the speed of ultrasonic sound in different materials relative to each other. I hypothesized that plastics and denser materials would conduct sound much more efficiently than less dense materials.

Materials and Methods: I obtained a reflectoscope which transmits ultrasonic sound underwater and seven different materials: plexiglass, flexible plastic, glass, steel, wood, cardboard, and duct tape. I tested each material by recording the speed the sound traveled and signal strength as shown on the reflectoscope. By comparing the results with those from the control group with no material, I could determine a good or bad conductor of sound and which had faster or slower signals.

Results: The final results were an average of many tests. After several experiments I found that plexiglass, steel, and flexible plastic were the greatest ultrasonic sound conductors, which proves my hypothesis correct that the plastics and denser materials did prove to be the best conductors.

Conclusion: Ultrasonic sound is commonly used to test machinery for flaws, or incontinuities. If more than one material is present in that machinery, then the speeds and strength of the sound signal received would be warped and therefore incorrectly portray the flaw and it's location. This could easily cause incorrect repairs and injuries. My conclusion is that scientists and engineers should take into account the speeds of sound in different materials when testing, and that if multiple materials were present, then the results would be different than those with a single material present.

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

My project is about the speeds that ultrasonic sound travels in different materials.

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.

All the equipment used for experimenting was from engineer Dave Kammerer