

CALIFORNIA STATE SCIENCE FAIR 2005 PROJECT SUMMARY

Name(s)

Christian D. Valley

Project Number

J1131

Project Title

How Does Temperature Affect the Breaking Points of Different Types of Fishing Line?

Objectives/Goals

Abstract

Objective: My project was to determine if the material a fishing line was constructed of affects the pounds of pressure (p.p.) a line withstands before breaking in different temperatures.

Methods/Materials

Materials and Methods: Three types of fishing line, each eight-pound test, were tested in a simple two foot high wooden framed machine I designed. The machine#s construction held constant the pulling force variable by utilizing a wing nut on a screw. In addition, a 100% proof knot, the Single San Diego, was used based on my research to eliminate the variable of knot tying from either slipping or weakness. The lines were tested four times each in three temperature-controlled environments of 6, 40, and 80 degrees Fahrenheit (F) after having fifteen minutes to adjust to the environment. The pounds of pressure was determined when the line snapped in the simple machine.

Results

Results: Braided line withstood 18 p.p. in 6 degrees F, 15.3 p.p. in 40 degrees F, and 21.6 in 80 degrees F. Fluorocarbon withstood 7.9 p.p. in 6 degrees F, 9.8 in 40 degrees F, and 13.7 in 80 degrees F. Monofilament withstood 8.3 p.p. in 6 degrees F, 8.8 p.p. in 40 degrees F, and 8.1 p.p. in 80 degrees F.

Conclusions/Discussion

Conclusions: In conclusion, the line constructed with multiple filaments of cloth, braided line, consistently withstood more pounds of pressure in each temperature environment than each of the other types of lines. Through my research, the chemical composition of monofilament line and fluorocarbon contained chemicals, which expanded and contracted according to the temperature. The colder the temperature the less pounds of pressure those lines held, and, the higher the temperature the more pounds of pressure those lines withstood. Therefore, a fisherman benefits by using braided line which was the strongest line in all temperatures, but must consider other factors such as line color, line density, and line visibility when selecting a line, and, of course, line test strength at lower temperatures.

Summary Statement

This project analyzed three types of fishing lines' breaking points in three temperature controlled environments.

Help Received

Dad helped with supervision of construction of simple machine; Mother helped with taking me to interviews.