CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
J0223

Project Title
Lifting with Gears

Abstract

Objectives/Goals
Determine if gears will affect how much weight you can lift with a pulley

Methods/Materials
Materials: · Pieces from a K#NEX set; · Gears, pulleys and motors from a K#NEX set; · String; · Plastic bucket; · Rocks; · Kitchen scale; · Plastic cup.
Methods
A. Build a K#NEX frame
B. Build a K#NEX cradle
C. Install a direct drive Motor
D. Put a Pulley on the Drive Shaft
E. Put rocks in the cradle
F. Record the weight
G. Start the Motor
H. Add weight in increments until the motor can lift no more
I. Record the final weight
J. Add a set of gears between the motor and the drive shaft
K. Repeat steps E-J

Results
Each added gear set allowed the motor to lift more weight.
· Direct drive - 945 grams
· One gear set - 1,295 grams
· Two gear sets - 2,690 grams
· Three gear sets - 3,590 grams

Conclusions/Discussion
The more gears you add the greater the weight that can be lifted.
Gears act like pulleys and ropes by reducing effort.

Summary Statement
My project is about using gears to increase lifting ability.

Help Received
My dad helped me by getting the books and helping build the frame.