

The NASA SCI Files™
The Case of the
Powerful Pulleys

Segment 3

The tree house detectives continue investigating pulleys, and Bianca continues researching various engineering careers for her presentation. Everyone is positive that pulleys are the answer to getting Jacob into the tree house. However, they are a little confused about how many pulleys to use. They decide to contact Ms. Gail Nowell's class, a NASA SCI Files™ Kids Club, in Raleigh, North Carolina. Now the tree house detectives think they have all the information they need to lift Jacob. Fortunately, they test their apparatus before putting Jacob in it, and they quickly realize that they have not considered safety features. The tree house detectives visit Ms. Rines, a safety engineer at NASA Langley Research Center in Hampton, VA. Ms. Rines suggests that they also need to consider human factors and sends them to see Dr. Kara Latorella, a human factors engineer, also with NASA Langley Research Center. Back at the tree house, the detectives have used their last pulley, but Jacob is still too heavy to lift. They stop by Dr. D's lab in hopes that he will be able to help them reduce the force needed to lift Jacob and to help them figure out what to do with all that rope from the pulley system.

Objectives

The students will

- investigate how pulleys make work easier.
- construct a lever to lift a large weight.
- investigate the use of gears.

Vocabulary

apparatus - the equipment or material for a particular use or job

compound machine - a machine consisting of two or more simple machines

gear - a toothed wheel that developed from the wheel and lever

human factors - study of how people behave physically and psychologically in particular environments and with certain products or services

