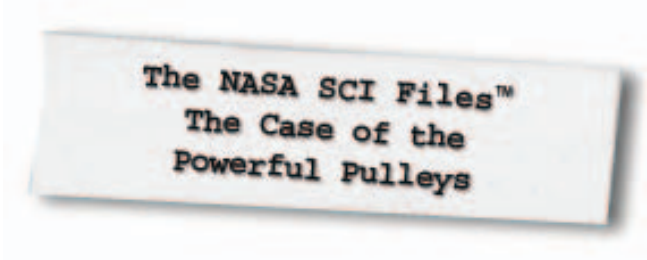

Segment 1

Jacob has broken his foot and is eager to rejoin his friends in the tree house. The tree house detectives decide that devising a plan to get Jacob safely into the tree house will be their next case and quickly begin to research the best way to lift him. Bianca decides that this case will also be a great opportunity for her to learn more about women engineers for her career day presentation. The tree house detectives begin their investigation with Dr. D, who helps them learn about energy, force, motion, and doing work. Deciding that they have the "energy" and are willing to do the "work," the tree house detectives contemplate building an elevator. However, after visiting Otis Elevator, they realize building one is too complicated even for the tree house detectives. On the way back to the tree house, they see a ramp and determine that must be the solution. They contact a friend who is in a wheelchair to learn more about ramps and how they help people with disabilities gain access to places.

Objectives

The students will

- understand the concepts of inertia.
- understand how the amount of force changes with the use of various simple machines.
- distinguish between potential and kinetic energy.
- use formulas to calculate work.
- learn that the Sun is the source of all energy for food chains.

Vocabulary

energy – ability to do work

force – push or pull that gives energy to an object, causing it to start moving, stop moving, or change its motion

friction – force that opposes the motion of an object

gravity – the mutual force of attraction between objects

inclined plane – slanted surface used to raise an object

inertia – tendency of objects to remain in motion or stay at rest unless acted upon by an unbalanced force

kinetic energy – energy that a moving object has due to its motion; energy of motion

potential energy – energy stored in an object due to its position

ratio – the relationship in quantity, amount, or size between two or more things

simple machine – any of various elementary devices considered as the elements of which all machines are composed and including the lever, the wheel and axle, the pulley, the inclined plane, the wedge, and the screw

weight – response of mass to the pull of gravity

work – product of a force applied to an object and the distance through which the force is applied; force times distance