



The NASA SCI Files™
The Case of the
Powerful Pulleys

Segment 2

The tree house detectives continue to search for a way to lift Jacob into the tree house. Dr. D asks them to meet him at the circus to learn more about simple machines. They are not quite sure what a circus has to do with simple machines, but they know if Dr. D is there, it will be fun. After the circus, they decide that pulleys might be helpful in lifting Jacob. They discover on the Internet that NASA uses pulleys to lift the Space Shuttle onto the back of an airplane. To learn more about pulleys, they dial up Ms. Ennix, an aerospace engineer at NASA Dryden Space Flight Center in California. The tree house detectives feel that this is definitely the way to go but think they need to do a little more research. They visit Ms. Lisa Jones, an aerospace engineer at NASA Langley Research Center in Hampton, VA who uses pulleys to lift airplanes for crash tests at the gantry. Now they are certain that pulleys are the answer, but there are just a few little problems to overcome.

Objectives

The students will

- understand the principle of the Archimedes Screw.
- understand and use simple machines.

Vocabulary

fulcrum – fixed point at which a lever pivots

gantry – a platform made to carry a traveling crane and supported by towers running on parallel tracks

lever – a bar that is free to pivot, or move about, a fixed point when an effort force is applied

load – something taken up and carried

load distance – the distance the load is moved

pulley – a small wheel with a grooved rim used with a rope or chain to change the direction of a pulling force and in combination to increase the force applied for lifting

screw – inclined plane wrapped around a cylinder to form a spiral

wedge – inclined plane that moves

wheel and axle – a simple machine consisting of a grooved wheel turned by a cord or chain with a firmly attached axle (as for winding up a weight) together with supports

