Double Power

**What to do:** First, build two pulleys. An easy way to do this is to unwind the neck of a wire hanger. Push the end through the center of one thread spool. (If you have to straighten the wire a bit to get it through the spool, that's fine.) Then bend the hanger back into shape. When you have fastened the hanger back together, your pulleys look like this:

Now place the two chairs back to back and place the broomstick between them. Then tie a loop of the string around the stick to hold the first pulley. Cut a piece of string long enough to tie around the book, which is the load you are going to lift. Cut another piece of string 4 feet (1.2 m) long. Tie it to the string on the book. Hook the second pulley into the string that is tied around the book you plan to lift. Things should be set up like this:

Now pull up on the string that runs around the second pulley. Measure the amount of string you pull up to lift the book 3 inches (7.5 cm).

**What happens:** you will be using less force to lift the book than you did using only one pulley. You will also pull 6 inches (15 cm) of string through the pulleys to lift the book 3 inches (7.5 cm)

**Why:** Using two pulleys gives you what is called a mechanical advantage. This simply means that it is easier to lift the book than it was before. However, you have to pull twice as much string through the pulleys to gain this advantage.

**YOU NEED**
- two wire clothes hangers
- two empty thread spool's
- two chairs
- broomstick
- scissors
- 10 foot (3 m) in length of strong string
- book