

# Lifting , Lifting

## Procedure

- 1. Collaborate** Work with a partner. Tie a string to a spring scale. Hang a mass from the other end of the string.
- 2. Measure** Lift the scale to raise the mass 10 cm above the table. In the space below, record the force shown on the scale, and draw the arrangement next to your numerical data.

- 3. Experiment** Arrange a pulley as shown on page F121 of your book. Place the mass from step 1 at one end of the string, and the scale at the other. Lift the mass 10 cm off the table by pulling the spring scale down. Record the force, then draw the arrangement in the space below.

- 4.** Repeat step 3 using two pulleys, as shown in your book. Draw your arrangement and record the force in the space below.

5. Repeat step 3 using four pulleys, as shown in your book. Draw your arrangement and record the force in the space below.

6. **Use Variables** Investigate other ways to arrange the pulleys and the mass. Measure the force. Draw each arrangement and record the results in the space below.

## Conclusion

Write the answers to the questions below.

1. **Analyze Data** Which arrangement requires the least force to lift the mass a distance of 10 cm?

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2. **Hypothesize** How do pulleys change the force needed to lift objects? Form a hypothesis about the way a pulley works.

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## Investigate More!

**Design an Experiment** In each of the three pulley arrangements, what length of string must you pull down to raise a mass 10 cm?

Write a new procedure and follow the steps to find out.

