

2. Write out your lab procedure, including a detailed description of the measurements to take during each step and the number of trials to perform. You may use **Figure 1** as a guide to one possible setup.
3. Ask your teacher to approve your procedure.
4. Follow all steps of your procedure.
5. Clean up your work area. Put equipment away safely so that it is ready to be used again.

ANALYSIS

1. **Organizing Data** For each trial, make the following calculations:
 - a. the weight of the mass being raised
 - b. the weight of the mass on the string
 - c. the work input and the work output
2. **Analyzing Results** In which trial did a machine perform the most work? In which trial did a machine perform the least work?
3. **Organizing Data** Calculate the efficiency for each trial.
4. **Analyzing Results** Is the machine that performed the most work also the most efficient? Is the machine that performed the least work also the least efficient? What is the relationship between work and efficiency?

CONCLUSIONS

5. **Drawing Conclusions** Based on your calculations in item 4, which is more efficient, a pulley system or an inclined plane?
6. **Evaluating Methods** Why is it important to calculate the work input and the work output from measurements made when the object is moving with constant velocity?

EXTENSIONS

7. **Designing Experiments** Design an experiment to measure the efficiency of different lever setups. If there is time and your teacher approves, test your lever setups in the lab. How does the efficiency of a lever compare with the efficiency of the other types of machines you have studied?
8. **Building Models** Compare the trial with the highest efficiency and the trial with the lowest efficiency. Based on their differences, design a more efficient machine than any you built in the lab. If there is time and your teacher approves, test the machine to determine whether it is more efficient.