

NAME _____

INCLINED PLANES

BACKGROUND INFORMATION: An inclined plane is a simple machine with a straight, slanted, or sloped surface. They allow objects to be rolled or slid (moved) to higher elevations. Inclined planes make it easier to do work because they multiply effort force. The inclined plane does this by changing the distance an object is moved. *Less force is needed to move a certain mass because it is moved a longer distance.*

Steeper planes require more effort force because they use less distance. Gradual planes require less effort force to be applied over a longer distance. For inclined planes, the mechanical advantage is found by dividing the length of the incline by the height of the incline. Screws and wedges are simple machines that change the effort force required in a way that is similar to the inclined plane.

QUESTIONS:

- (1) How is the force required to raise a 500 g mass affected by the height of an inclined plane?
- (2) How is the force required to raise a 500 g mass affected by the length of an inclined plane?

HYPOTHESES:

- (1) _____

- (2) _____

MATERIALS:

Board	Wood blocks	5 g weight
Spring scale	Meter stick	

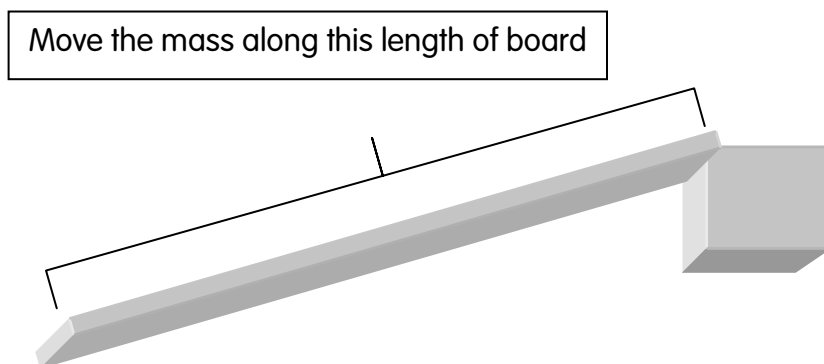
PROCEDURE:

1. Read all parts of the procedure.
2. Decide what you will change (independent variable) and what you will measure (dependent variable).
3. Create a data table to record your data for question 1.
4. Create a different data table for your data for question 2.

} *Use your Science Handbook for help.*

Question 1 – the height of the plane

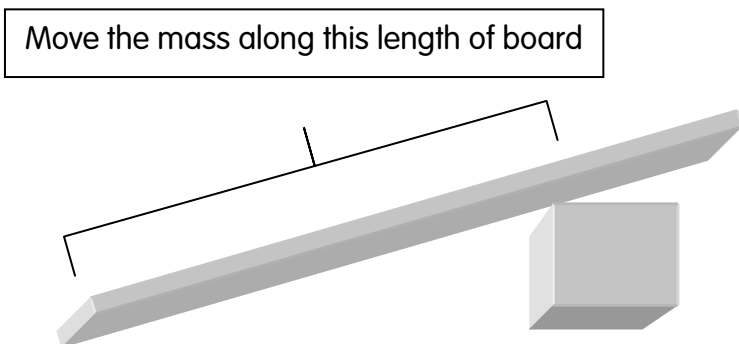
1. Use the board and blocks of wood to make an inclined plane.



2. Use the spring scale to pull the mass up the inclined plane. Record the force needed to move the mass to the top of the plane.
3. Repeat for a total of 5 trials.
4. Change the height of the inclined plane and repeat steps 2 and 3.
5. Change the height of the inclined plane again and repeat steps 2 and 3.

Question 2 – the length of the plane

1. Make another inclined plane. This time move the board so that the length of the plane (not the height) is different.



2. Use the spring scale to pull the mass up the inclined plane. Record the force needed to move the mass to the top of the plane.
3. Repeat for a total of 5 trials.
4. Change the length of the inclined plane and repeat steps 2 and 3.
5. Change the length of the inclined plane again and repeat steps 2 and 3.

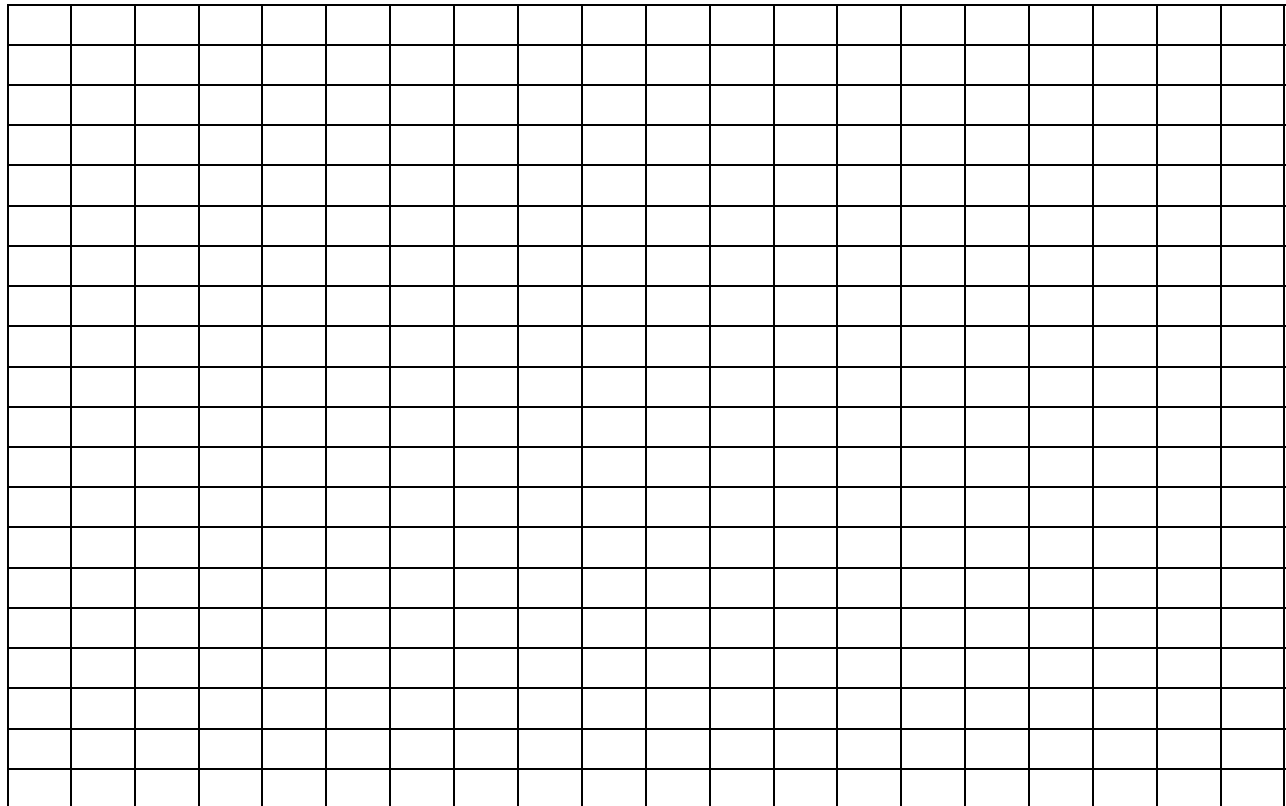
DATA:

Data Table 1:

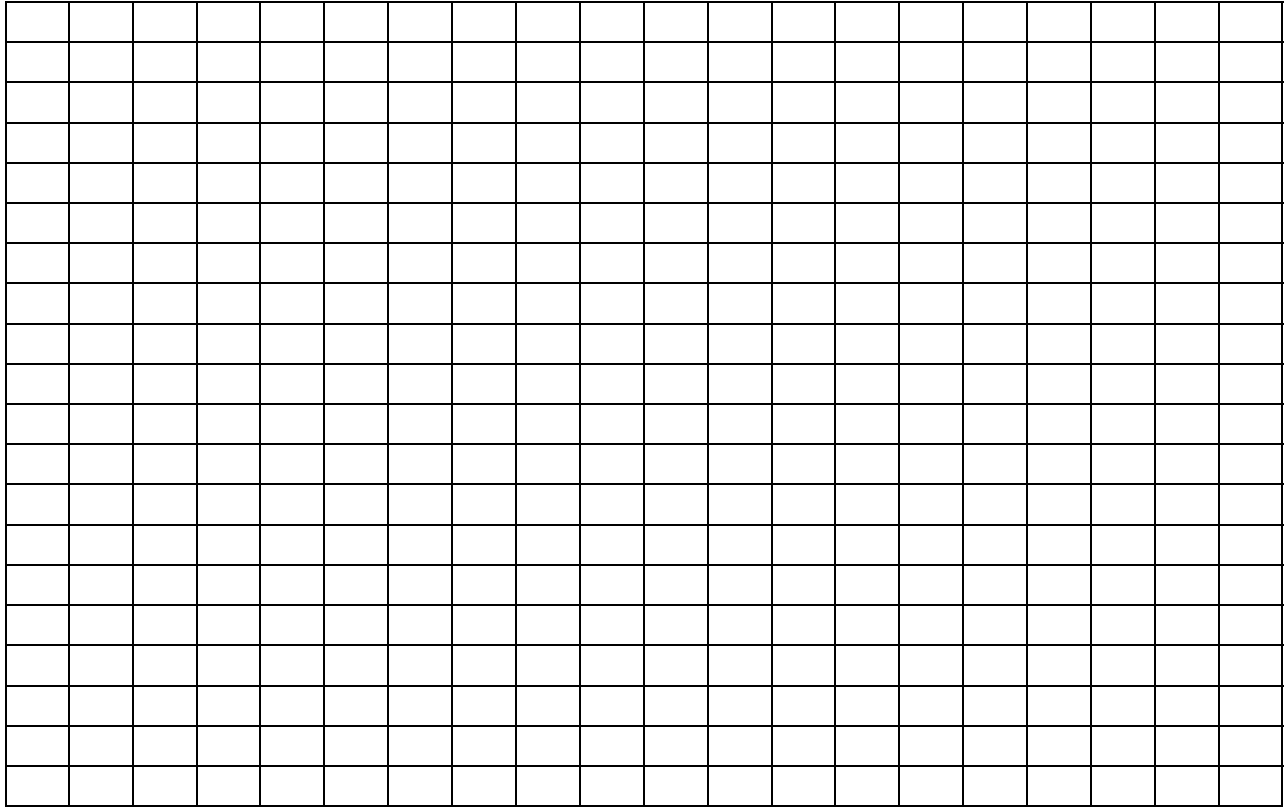
Data Table 2:

DATA ANALYSIS:

Graph your mean data:



Look at your data very carefully. What is the relationship between plane height and force needed to move the load?



Look at your data very carefully. What is the relationship between plane length and the force needed to move the load?
