Name: _____   **Date:** _____
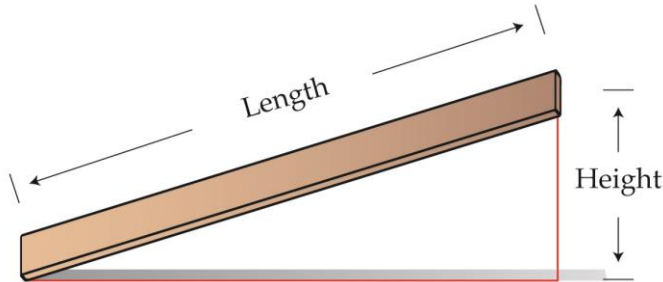
Tools and Equipment, Part I Activity –
Inclined Plane Worksheet

$$Mechanical\ Advantage = \frac{Input\ Distance}{Output\ Distance} = \frac{Output\ Force}{Input\ Force}$$

$$Mechanical\ Advantage = \frac{Input\ Distance}{Output\ Distance} = \frac{Slope\ Length}{Height}$$

Instructions/Questions

A   Measure the length and height of Inclined Plane A (1ˢᵗ station):

Length: _____ (c*m*)

Height: _____ (c*m*)

1. What is the mechanical advantage based on these measurements? _____

2. What was the required force to raise the object?

Without the inclined plane: (Output force) _____ (*g*)

With the inclined plane: (Input force) _____ *(g)*

3. What is the mechanical advantage based on these measurements? _____

B   Measure the length and height of Inclined Plane B (2nd station):

Length: _____ (c*m*)

Height: _____ (c*m*)

1. What is the mechanical advantage based on these measurements? _____

2. What was the required force to raise the object?

Without the inclined plane: (Output force) _____ (*g*)

With the inclined plane: (Input force) _____ *(g)*

3. What is the mechanical advantage based on these measurements? _____

C Measure the length and height of Inclined Plane C (3rd station):

> Length: _____ (c*m*)
>
> Height: _____ (c*m*)

1. What is the mechanical advantage based on these measurements? _____
2. What was the required force to raise the object?

> Without the inclined plane: (Output force) _____ (*g*)
>
> With the inclined plane: (Input force) _____ *(g)*

3. What is the mechanical advantage based on these measurements? _____

D Measure the length and height of Inclined Plane D (4th station):

> Length: _____ (c*m*)
>
> Height: _____ (c*m*)

1. What is the mechanical advantage based on these measurements? _____
2. What was the required force to raise the object?

> Without the inclined plane: (Output force) _____ (*g*)
>
> With the inclined plane: (Input force) _____ *(g)*

3. What is the mechanical advantage based on these measurements? _____

Results

1. Did you obtain different mechanical advantages for the different methods of measuring? If so, was the difference large?

   _____

   _____

2. Which inclined plane had the greatest mechanical advantage?

   _____

   _____

Conclusions

1. Does calculating mechanical advantage just with the dimensions of the inclined plane really work? That is, does the calculation describe what really happens? Write a short paragraph explaining your answer.

    _____

    _____

    _____

    _____

    _____

2. If you are the engineer designing a ramp for a construction site to move a wheelbarrow a height of 100 feet, which inclined plane would you use? Why?

    _____

    _____

    _____

    _____

    _____

3. What are some possible sources of error in this experiment?

    _____

    _____