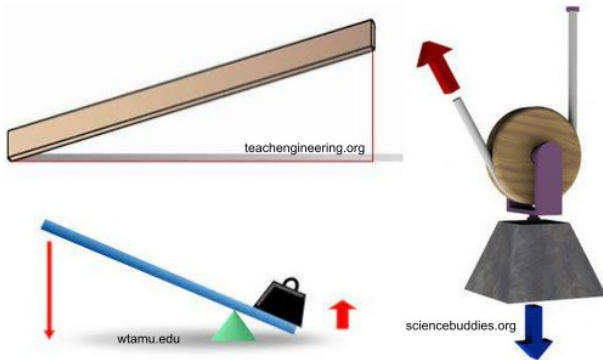


Simple Machines: Same Work with Less Effort (student version)



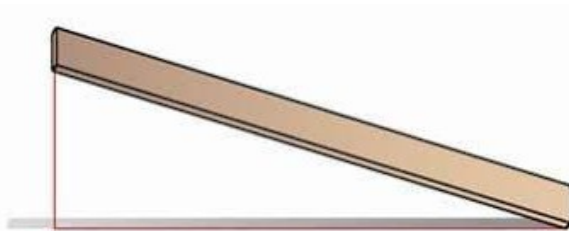
Simple machines let us do the same work with less force!

Simple Machine 1: Inclined Plane

When you lift the load straight up from floor to chair:

How much force is needed to lift the cup?: _____ N

Over what distance (height) did you lift up the cup?: _____ cm



When you lift drag the load along the ramp:

Force to move cup up the ramp: _____ N

Over what distance (measured along the ramp) did you drag the cup?: _____ cm

Using the ramp, the force needed to lift the load was: lower / higher

Using the ramp, the distance over which the force acted was: longer / shorter

A ramp is an example of a simple machine called an inclined plane

Simple Machine 2: Pulley

When you lift with a pulley:

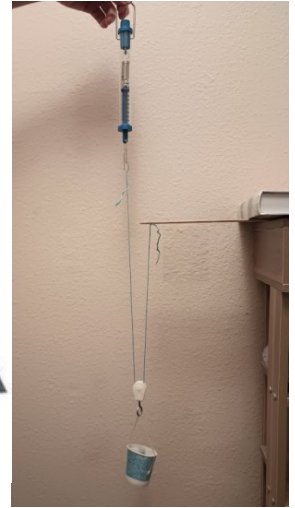
How much force is needed to lift the load? _____ N

Over what distance does the spring scale move to lift the load to the top? _____ cm

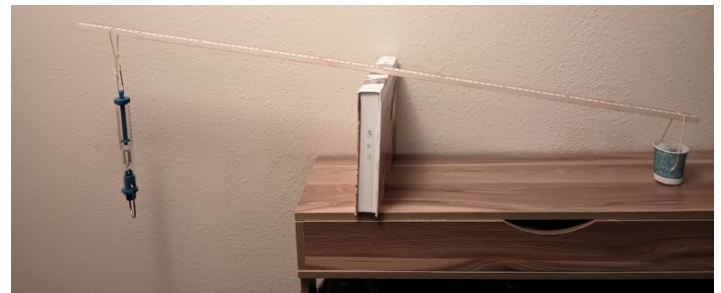
When you lift directly (without pulley):

How much force is needed to lift the load? _____ N

Over what distance does the spring scale move to lift the load directly? _____ cm



Simple Machine 3: Lever



Fulcrum in the middle:

How big a force is needed to lift the load with fulcrum in the middle? _____ N

How does this compare to the force needed without a machine?

Smaller / Larger / about the same

Fulcrum closer to load:

How big a force is needed to lift the load with fulcrum closer to load? _____ N

How does this compare to the force needed without a machine?

Smaller / Larger / about the same

Distance for the force to act is: smaller / larger / about the same

What will happen if the fulcrum is closer to the force, further from the load?

The force needed to lift will be: smaller / larger / about the same

All simple machines allow you to use a smaller force, over a longer distance to accomplish the same amount of work (eg: lifting a load to a certain height).