8

The Pulley

Gosh I love pullies. They are just so cool! I mean come on....Check them out! They are round and they....um....their round and um.....well.....they have a hole in the middle!

Okay, so maybe I don't really love pullies but I do like what they can do.

So what is a pulley?

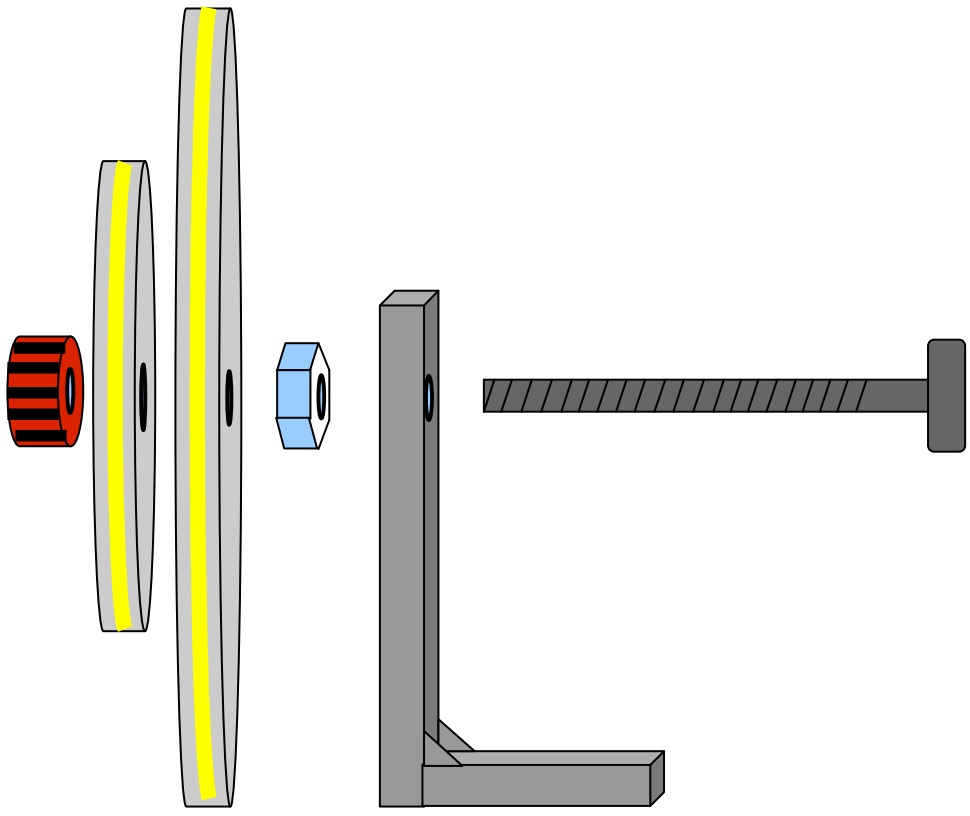
A pulley is one of the six simple machines that we have all come to know and love. The six simple machines include the inclined plane, the lever, the wedge, the screw, the wheel and axle and, of course, the pully.

You want a little more?...Okay
A Pulley is a Grooved Wheel that turns around an Axle, and a rope or a chain travels in the groove.
A Pulley changes the direction of the Force.
A Pulley may be Fixed, Moveable, or used in combination.
The Simple Pulley gains nothing in Force, Distance or Speed, but it changes the Direction of the Force.

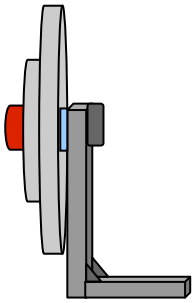
Nuff said, let's build something.

The simple fixed pully

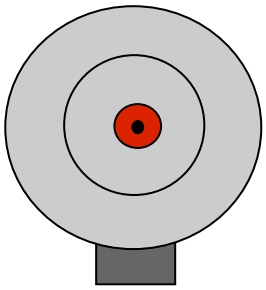
Start by attaching a large pulley onto the the bench mount using a screw, steel nut and plasitic nut as shown below.



So, in theory, you should have something like this when you are done:



Side View

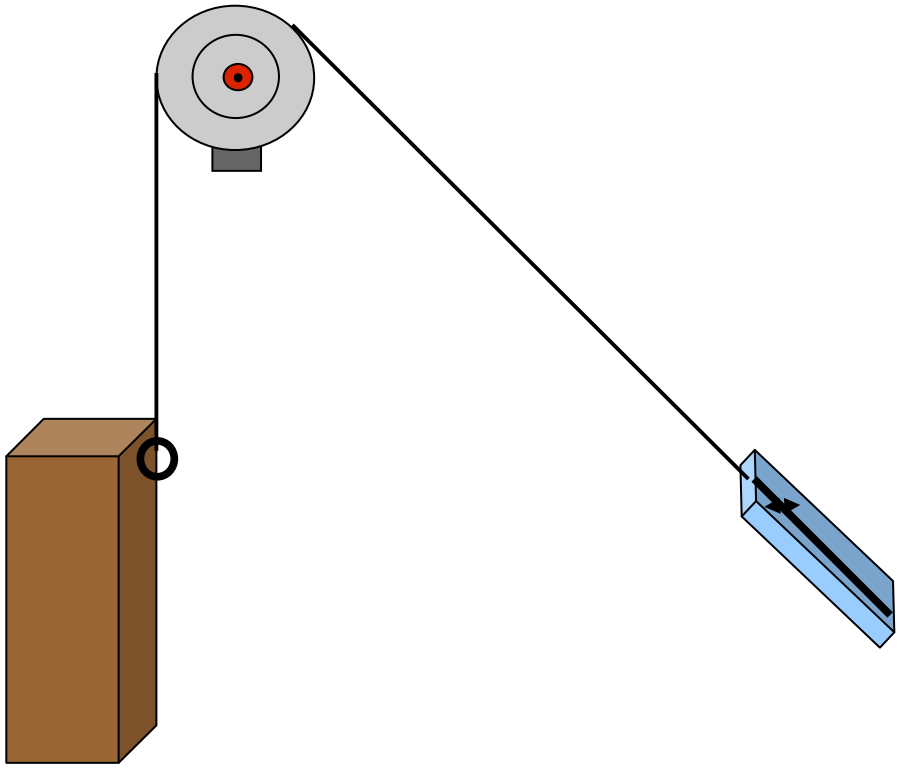


Front View

Cool. You are about to start your first lab.

Lab 1.

Exercise 1. A simple fixed pulley.
First, record the weight in Newtons in your lab book of your block.
Now, simply attach the pulley asssembly onto your bench with a clamp and use a string and spring scale to measure the force needed to lift the block using the LARGER pulley. See diagram



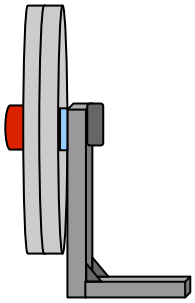
Exercise 2. A simple fixed smaller pulley.
Now repeat the experiment with the smaller pulley on the assembly.

Conclusions of Lab 1

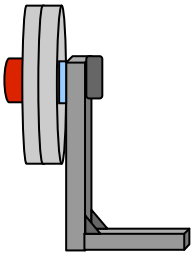
Did the pulley size make any difference?

Lab 2.

Now you need to rearrange a few thingies.....First, place two large pulleys on the assembly you already made. So, unscrew the screw, pull off the small pulley and place on another large pulley. So it should look kinda like this:



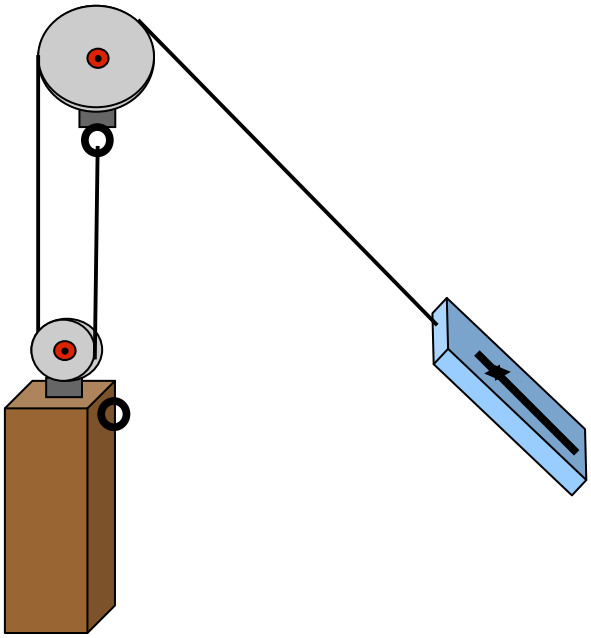
Now you have to make another assembly just like the one above except it will have two small pulleys...like so:



Now this new bad boy should be attached to the weight block.

Exercise 1. A fixed pulley and a movable pulley. 2 loops

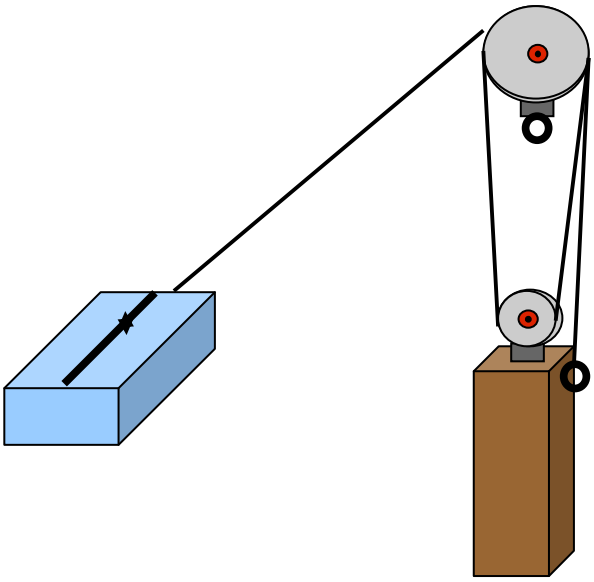
For starters, let's just do this simple experiment. Hook the end of the string onto the bench mount. Loop it once around one small gear on the weight block and then once around a large pulley as shown.



Now how much force is required to lift the block??
How much more or less string did you need to pull to lift the block?

Exercise 2. A fixed pulley and a movable pulley. 3 loops

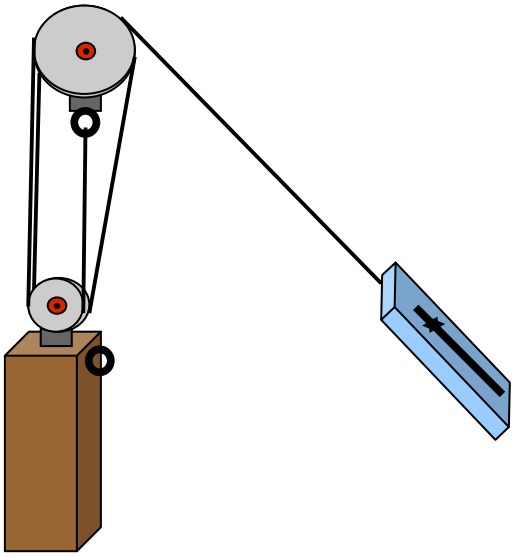
Okay, let's up the loops. Hook the end of the string onto the weight block. Loop it once around a large pulley on the bench and then string it down to loop weight block and then once around a large pulley as shown.



Now how much force is required to lift the block??
How much more or less string did you need to pull to lift the block?

Exercise 3. A fixed pulley and a movable pulley. 4 loops

Okay, let's up the loops. Hook the end of the string onto the bench. Loop it once around one small gear on the weight block. Loop it once around a large pulley on the bench and then string it down to loop weight block again and then back once more around a large pulley as shown.



Now how much force is required to lift the block??
How much more or less string did you need to pull to lift the block?

Give me an overall conclusion to this lab!