

Calculating Work and Power to go up and down a slide

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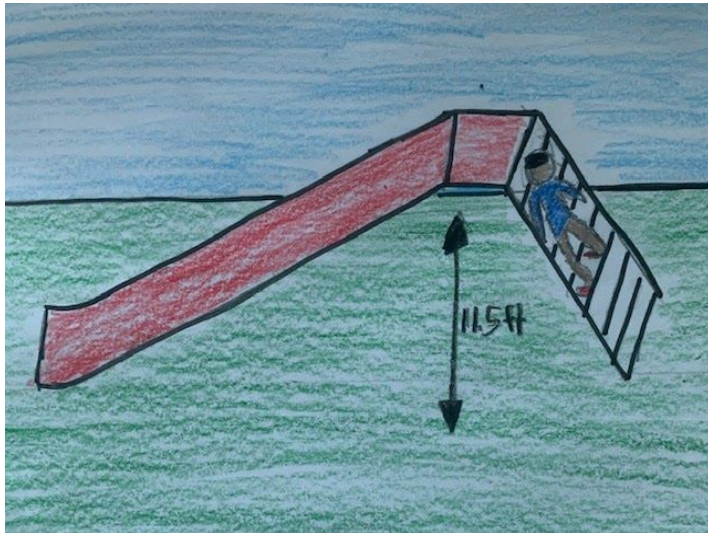
While you are going up and down a slide you are using work and power. You can measure your work in power in different ways. We determine our work by using the equation $\text{work} = \text{force} \times \text{distance}$. Then we determine our power by work over time or $\text{power} = W/T$. In this lab you will see how to do both. But in order to do these equations, you have to collect data. The data you need is your weight time up and down the slide and high of the slide. Once you have everything you can find your work and power.

Table of contents

The Experiment.....	2-4
Expermintle data.....	2
Picture of slide.....	2
How to get lbs to newtons.....	2
Equation for	
work.....	3
Math equation for work.....	3
Equation for power.....	3
Math equation for power.....	4
conclusion.....	4

Data table

weight in-lbs	weight in kg	Weight in newtons	Time up to slide	Time downslide	Hight of slide in feet	Hight of slide in meters
115lbs	52.163kg	231N	15.40	7.7	11.5 feet	3.5meters



Conversion of lbs to newtons

Before you can do the force x distance you have to find what your force is. The force is your weight but you need to convert lbs into newtons. You do this by converting your lbs into kilograms which you do by dividing your lbs by 2.2. Next, you take your new number and divide it by .225 and that number that you get is your newtons. This is also shown below.

Conversion of lbs to kilograms

$$115\text{lbs}/2.2=52.263\text{kg}$$

Conversion of lbs to newtons

$$52.263\text{kg}/.225=231\text{N}$$

Equation For work

now that you have your lbs into newton you can figure out what your work is for going up and down the slide. As I said before the equation is $\text{work} = \text{force} \times \text{distance}$

Step one: $\text{work} = \text{force} \times \text{distance}$ (wright out the equation)

Step two: $\text{work} = 231\text{N} \times 3.5 \text{ meters}$ (substitute you force for your weight in newtons and substitute your distance for the height of the slid in meters)

Step three: $\text{work} = 808.5 \text{ Jules}$ (time your newtons by meters and you get your work in Jules)

Equation For Power

You can get power by work/time (work over time) in order to do this you have to use the time for going up to the slide. Also, the work is your amount of Jules that you get from your work equation.

Equation

$$\text{power} = \frac{\text{work}}{\text{time}} = \text{jules per seconds}$$

(then turn the Jules per seconds into wats which is your power)

My Equation

Step one: power= $\frac{\text{work}}{\text{Time}}$ =jules per second

Step two: power= $\frac{808.5\text{J}}{15.40}$ =jules per second (substitute your work and your time in)

Step three: power=52.1jules per second (divided the work by time which will give you the Jules per seconds)

Step four: power= 52.1 wats (chang the Jules per seconds into wats to give you your power.)

Conclusion

Well, it took me 808.5 Jules of work to get up the slide. Also, my power was 52.1 watts of energy. Now we know how to find your power and work from going up a slide. There is a lot of different things that you need to be able to find out your work and power for going down a simple slide.