

Assessed Experiment on the Efficiency of a Ramp

Planning

I am investigating the efficiency of a ramp depending on the mass of the load , the height of the ramp or the angle. I have chosen the amount of load to be lifted up the ramp because I think I can get a more accurate set of results this way. The ramp is a basic but very effective way of moving objects to a greater height more easily than simply lifting.

Fair Test

- I will take all of my results on the same day with the same equipment and area.
- I will repeat my test three times for a more accurate test.
- I will pull the bucket along at the roughly same steady speed every time.
- I will take the results myself so they will not differ.

A fair test is important in all investigations because otherwise the results will not be reliable. A fair test should avoid being biased and enable repeatability.

Prediction

The variable that I have chosen is the increase in masses and therefore weight to the bucket. I would predict that as the mass increases the force required to achieve a constant speed will also increase. As the mass is increased the friction between the bucket and the ramp increases. Gravity is a constant force on all masses the incline is the same for each increase in mass. To overcome the resistance of the inclined surface the force is greater for larger masses.

If all things are equal that is gravity, the incline and speed. Then I predict that for each doubling of the mass the force will have to double.

Techniques and Safety considerations

- I will mark the ramp with a distinctive line to keep it inline with desk in case it slips. This is to get more reliable results.
- To make sure the ramp does not slip I could put a door stop or wedge in place.
- Pull the bucket along with same steady force.
- Carry the ramps with two people. So nobody gets hurt.
- Measure the length of the ramp, the height of the ramp and the weight of the bucket. For later calculations.

Preliminary Work

Preliminary work is not always necessary but is very useful and should be used when you would like to get accurate scales and measurements. Preliminary work is a check on all the things that can differ in the experiment like weights, lengths and other measurements. In this case you can decide what height the ramp is the mass increase and the length that you pull the bucket up the ramp. I am going to increase the weight of my bucket by 100grams every time. In my preliminary work I found out that if I wanted 7 results on my table I would need to have my increases under 200g each time. If had used more than 200g increase I would have had to use a 100N metre which is not as accurate as the 10N metre because the scale is larger.

Method

First of all I place the ramp on the desk and gather my equipment, masses, bucket and Newton Metre. I attach the Newton metre to the bucket using string and then place it at the bottom of the ramp. I pull the empty bucket up the ramp a constant steady speed and repeat this three times and then place the next mass into the bucket. I pull the bucket up the ramp 1.5m up the ramp and then record the results in a table.