

# Science research, predictions, and observations - lab report example



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## Science Research, Predictions, & Observations

### NEWTON Newton's Second Law – Conducting an Experiment Newton's

Second Law involves force and mass as being the main variables that impact how an object obeys gravity and falls. Therefore, when a heavy rock and a feather are dropped at the surface of the earth, they are going to drop at different speeds. The feather is going to flutter and float gently in the friction of the air, and stay in the air longer than the rock, even if they are the same size. The feather has less inertia than the rock, so it does not want to drop straight down. The rock also falls faster, because they have different masses: the rock has more mass than the feather, and therefore it falls more quickly when it is within the earth's atmosphere. The force of gravity is greater on objects that have a heavier total mass.

2. When a rock and a feather are dropped on the moon, they are going to float in the air rather than falling, for a much longer time. There is no friction from the air to influence the feather, on the moon. “ The weight of an object is different on the earth and on the moon since the strength of the gravitational field is different” (Newton, 2009). The hammer still has greater mass, so it will still hit the ground on the moon, faster than the feather.

3. The rock falls faster and accelerates faster than the cotton ball, because there is not as much air resistance on it.

4. The containers fall at the same rate, apparently. I dropped them from about five feet: a drop of several stories may have been different. When the objects are in the containers, the air resistance is equalized.

### Newton's Third Law – Research and Predictions

1. In terms of the logic of the horse, when the horse pulls, it puts force on the

earth. It contacts the earth with its hooves, and pushes against the earth. At the same time, the earth exerts force itself. Meanwhile, the horse is exerting force on the wagon. It is a system of pushing and pulling, in which various forces have an impact on each other. The logic of the horse is that it will cause the wagon to accelerate, because of the force of the horse.

2. This may seem to make sense, but what the horse is stating incorrectly is the relative importance of its force on the wagon. The wagon and the horse are separate, so they have different levels of force acting on them, independently. The forces at work on the horse, are not the same as those at work on the wagon. The relation between the horse and the wagon is incorrect.

3. The force between the cart's wheels and the road is another force that can be added to the picture. From this perspective, the force exerted by the horse on the ground, has an effect on how the wagon moves. This then questions the fallacy of the non-relationship or separation of horse and wagon, into distinct entities which interact with each other physically.

4. It is a common idiom that people should pull themselves up by their bootstraps, which means that they should be independent and self-sufficiently resilient. However, it is impossible. " If they arise from the two masses themselves, they must be equal in magnitude but opposite in direction so that no net force arises from purely internal forces" (Newton, 2009). Pulling oneself up by one's bootstraps involves only internal forces.

#### REFERENCE

Hewitt, P (2010). Physical Science Explorations. New York: Pearson.

Newton's Second Law (2009). [http://theory.uwinnipeg.](http://theory.uwinnipeg.ca/physics/force/node3.html)

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Newton's Laws (2009). <http://hyperphysics.phy-astr.gsu.edu/hbase/Newt.html>