Virtual Lab: Force = Mass x Acceleration

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a push or pull on an object.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the difference between two opposing forces. Newton’s 2nd Law of Motion states that if a net force acts on an object, the object will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the direction of the force. **Acceleration** is a change in\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It can either be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (speeding up) or
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (slowing down).
4. Mass is the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ contained in an object.
5. Mass does not change with changes in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. The acceleration of any object falling to the surface of Earth is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m/s2.
7. This means that at the first second the object will be falling with a speed of 9.8 m/s2. At 2 seconds, the object will be falling at the rate of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; at 3 seconds, it will be falling at the rate of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and so on.



**Virtual Lab: Conclusion**

1. How is Newton’s Second Law related to gravity?
2. How does the force of gravity affect the rate of acceleration?
3. Describe what happens when *identical* objects are dropped on planets with *different* gravitational conditions.
4. Describe what happens when *different* objects are dropped under the *same* gravitational conditions.
5. Based on your data, how does mass affect weight?
6. What is the weight of a 24.52 kg Television dropped on Pluto (acceleration of 0.59 m/s2)?
7. What is the weight of a 45.40 kg Barbell dropped on Earth?
8. **Challenge**: A hammer is dropped on Planet X. If the hammer has a mass of 3 kg and a weight of 9 N, what is the gravitational acceleration of Planet X and is it more or less than that of Earth?