**Force Lab**

Directions: In this lab you will use the scientific method to test acceleration and force. In this lab you will design and complete your own experiment. Your experiment should answer the question: **How much force can your water balloon withstand when dropped from a height?** Your group is going to drop a water balloon from various height. Your group is trying to stop your water balloon from popping at the highest possible length. Your group will design a device to keep your water balloon “safe”. This is a competition to see which group can design a device that can withstand the force from the highest point dropped. Use the steps of the scientific method to set up your experiment. Spend some time brainstorming and designing your lab. Answer the following:

* What factors minimize the force on objects?
* If an object is dropped what could you do to minimize the force of the impact?
* How could you apply these things to a water balloon drop?
* Sketch a picture of a device your group WILL design to apply to your water balloon drop
* What materials do you need to bring to build your device?
* Who is bringing each material?

Answer the following Pre-Lab **Questions BEFORE YOU START YOUR EXPERIMENT?**

1. What are the Independent Variables?

 a. Calculate the masses of your independent variables

|  |  |  |
| --- | --- | --- |
| Water balloon with device | Mass is grams | Mass in kilograms |
| Day 1  |  |  |
| Day 2  |  |  |

1. What are the Dependent Variables?
2. What are some variables you would want to keep constant throughout your experiment? (at least 3)

**Title (be creative)**

**Purpose/Question you are trying to answer. TO DETERMINE…**

**Partners**

**Materials: You will need to bring your own materials.**

**Hypothesis: If/then…I think this because…(at least 2 reasons)**

**Write your own Procedure (Directions):**

**Results:**

**Day 1 Data Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Distance** | **Time** | **Velocity** | **Acceleration** | **Force** |
| **Trial 1** |  |  |  |  |  |
| **Trial 2**  |  |  |  |  |  |

**Day 2 Data Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Distance** | **Time** | **Velocity** | **Acceleration** | **Force** |
| **Trial 1** |  |  |  |  |  |
| **Trial 2**  |  |  |  |  |  |

**Conclusion:**

1. **Hypothesis correct?**
2. **Why or why not?(support with #s from your data tables)**
3. **Explain your results. How were you able to minimize the force on the balloon?**
4. **What went wrong?**
5. **What would you do differently/better next time?**