

Forces and Motion: Acceleration

Name: _____

**Please make sure you answer the questions along the way. ~Be sure to take your time and read the directions. Thank you!*

1. **Click the last icon at the bottom right, which says “Acceleration”.**
2. **Check all of the boxes (top right/yellow) each time.**
3. Move Friction slider to “None” (in the yellow box).
4. **Remove the crate. Put the child on the ground.**
5. Apply a force to the *child* to get the child moving until the speed is: **20 m/s.**
 - a. When you let go, what does the child do? _____


6. Change the mass to the refrigerator. Repeat the steps in #1.

- a. When you let go, what does the refrigerator do? _____
- b. Was it **harder/easier** to get the refrigerator to reach 20 m/s?


- c. Why do you think that was the case? _____

7. Remove the refrigerator and put the bucket of water on the ice. If you need to *reset* please remove the cart and move the friction slider to “None”. **Check all of the boxes (top right/yellow).** Apply a force to the bucket until it reaches top speed. The guy will do the splits. After this, fill in what you see in the table below:

Acceleration m/s ²	Top Speed m/s	Sum of Forces (N)	Water in the bucket (level or not?)

8. **Click the reset button** . Remove the cart and replace it with the bucket of water. Please move the friction slider to “None”. **Check all of the boxes (top right/yellow).** Apply a force to the bucket until it reaches top speed. **Be prepared to pause the simulation right before the guy will do the splits (right at 39.9 m/s).** After this, fill in what you see in the table below:

Acceleration m/s ²	Top Speed m/s	Sum of Forces (N)	Water in the bucket (level or not?)

9. Click the reset button  (friction will be present this time). Remove the cart and replace it with the bucket of water. Check all of the boxes (top right/yellow). Apply a force to the bucket until it reaches top speed. The guy will do the splits. Once the guy does the splits wait to see what happens.

10. Once the bucket comes to a stop explain what you saw and why you think it happened (include the terms: force, speed, friction, and acceleration or deceleration).

Additional Questions: (You can use other aspects of the simulation if needed to help you answer the questions).

11. How are mass and acceleration related (if you increase mass, what happens to acceleration)?

12. How are Force and mass related (if you increase mass, what will force do)?

13. If you increase speed, how will that affect acceleration?
