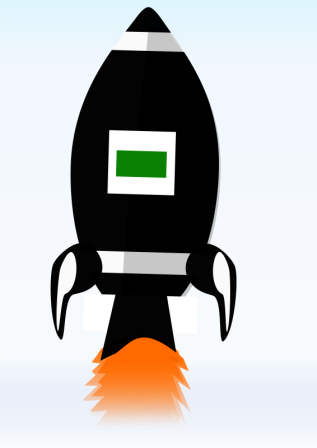
**Newton's Laws Final Quiz**

1. **For each object in the images below:  
   A) Draw a solid arrow to show the direction of the velocity.  
   B) *Answer the question*: Is a force acting upon the object?  
   C) *Answer the question*: Is the object accelerating?  
   D) If accelerating, draw a dotted arrow to indicate the direction of the acceleration (change in velocity).**

**The first one has been done for you as an example.**

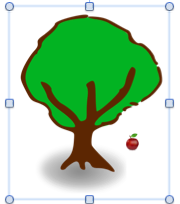
**🡺 Tip: Remember that “acceleration” just means a change in velocity, so if an object moves in a new direction, speeds up or slows down, these are examples of a change in velocity, or “acceleration”!**

**Example:**

****

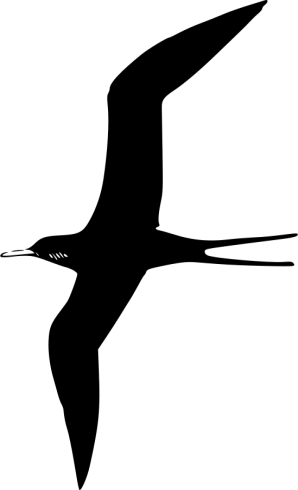
**A rocket is launched.**

**Is it accelerating? \_YES\_**



**An apple falls from a tree.**

**Is it accelerating? \_\_\_\_\_\_**



**A bird soars in a straight line through the air, without flapping its wings.**

**Is it accelerating? \_\_\_\_\_\_**



**A train slows down as it pulls into a station.**

**Is it accelerating? \_\_\_\_\_\_**

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1. **When we measure the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of an object, we measure the mass of an object by using the fact that the acceleration due to gravity is proportional to the mass.**

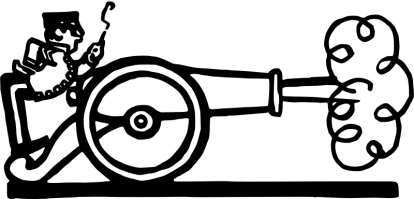
**a) volume b) density c) weight**

1. **What is the equation we use to solve for force?**
2. **In each scenario below, draw arrows to identify the action-reaction pairs. Also describe the forces.  
   The first one has been done for you as an example.**

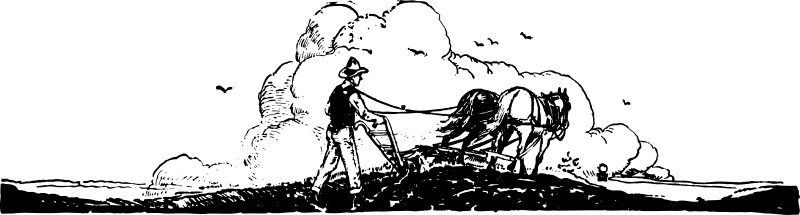
**Example:**

**The cannon ball is thrown forward (to the right) by the explosion in the cannon, shown by the blue arrow**

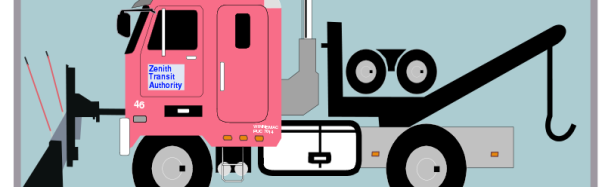
**The cannon is thrown backwards (to the left) by the force of the cannon ball, shown by the red arrow**

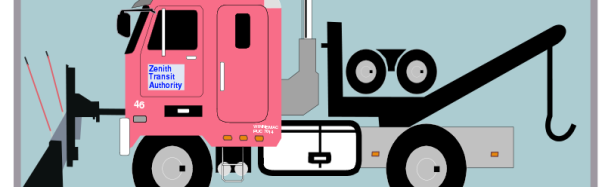






**Refer to the following silly pictures, versions A and B, to answer the next few questions:**

**A**  

**B**  

1. **To move the snowman, which snowplow will need to exert more force?**
2. **Why?**
3. **The forces are proportional to which of the following:**

**a) the mass of the snowman b) the volume of the snowman c) the velocity of the snowman**