Title: Weight and Contact Force

Objectives: To learn the difference between velocity, net force, and acceleration and to observe the difference between net force, contact force and weight when a person is standing on a scale in an elevator.

Instructions: Take the scale to the passenger elevator in the ESC or SWKT and stand on it. (Sometimes scales are already in the elevator.) Record the contact force observed, deduce the weight by reasoning, and describe what you know about the direction of the acceleration in the following situations. Do the entire activity when the elevator is either moving up or down for multiple floors. Do not try and mix data taken up and down in your analysis. Hint: What does a scale measure, how much you weigh or how hard you push on it? (Text Chapter 2)

1. What direction was the elevator moving?

2. Record the following information when the elevator is at rest.

   _______ contact force _______ weight
   _______ net force (size and direction) _______ direction of acceleration
   (Up, Down, or Zero)

   Just as the elevator begins to move.

   _______ contact force _______ weight
   _______ net force (size and direction) _______ direction of acceleration
   (Up, Down, or Zero)

   As the elevator moves between floors.

   _______ contact force _______ weight
   _______ net force (size and direction) _______ direction of acceleration
   (Up, Down, or Zero)

   As the elevator slows to a stop.

   _______ contact force _______ weight
   _______ net force (size and direction) _______ direction of acceleration
   (Up, Down, or Zero)

3. What happens when the acceleration and velocity are in the same direction?

4. What happens when the acceleration and velocity are in opposite directions?

5. Can the acceleration be zero when the velocity is not zero? When did this happen?

6. Can the velocity be zero when the acceleration is not zero? When did this happen?

7. What relationship do you observe between the net force and the acceleration?

I personally participated in the activity and wrote the response in my own words:

Signature: ____________________