Elevators can act as coconspirators with gravity, lowering you closer to the center of the Earth; or they can be in direct opposition to gravity, raising you to great heights. We should analyze exactly how this happens. Later, we will discuss what is required to either go up or come down when you live in a gravity-filled environment.

Objective:
Characterize (by measurement) what you feel during an elevator trip. Compare the motion of an elevator:
- C going down,
- C coming to a stop after going down,
- C starting to go down,
- C going up,
- C coming to a stop while going up and
- C starting to go up.
You should repeat these experiments as many times as necessary to confirm your results.

Equipment:
You should have some kind of scale and mass combination. This might be a spring scale with masses hanging from it, a lab/grocery scale with masses on top of it, or a bathroom scale with yourself (or a lab associate) on top of it. Your scale is the measuring device that quantifies what you feel while in the elevator. That is, if it measures a greater-than-normal weight, it is telling you that something is making you feel heavier. Likewise, if it measures a less-than-normal weight, it is telling you that something is making you feel lighter.

At some point you should trade scales with another lab group in order to compare the measurements that are made. Assess whether all scales tell you the same thing.

You also have a variety of elevators to evaluate. There are two in the natural science building, and one in the adjoining lecture hall. (You might also trek to other nearby buildings.) Make sure that you evaluate only one elevator at a time.

Finally, there is a nice set of stairs across from the elevators in the science building. If you have a hand-held measuring device, you can compare the changing motion of walking up and down stairs to the changing motion of an upward or downward progressing elevator.

Questions you might consider:
Exactly when does your weight change? By how much does your weight change? Is this a fixed amount, or a percentage of your total weight? Do all elevators change your weight in the same way? Do all measuring devices measure your weight change in the same way? What is the difference in definition between weight and mass? What would happen to your weight (as measured by the scale) if the elevator cable suddenly broke?

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[1] You might also be able to use a calculator based data recorder and an accelerometer for this lab.