



Energy Downer

STEM Sims

Lesson 1: Moving On Up

Most elevators that move people and materials between floors operate by converting electrical energy into mechanical energy. These types of lifts are called traction elevators. They make use of a heavy counter-weight to offset the weight of the elevator cab, people, and objects.

Doing the Science

1. Start the Energy Downer Simulation by clicking on the “Sim” tab.
2. Click on the “Traction” icon under Elevator Type.
3. Note and record all of the relevant information about the elevator in Table 1.
4. Click on the “Maximum Load” button located at the bottom of the screen. Note and record the new Elevator Load in Table 2.
5. Click the “Up” arrow on the elevator. Note and record the “Motor Energy” in Table 2.
6. Click the “Down” arrow on the elevator. Note and record the “Elevator Load” and “Motor Energy” in Table 2. Repeat this process until all people are moved up and the Time of Day changes to evening.
7. Repeat the investigation to collect data for moving the people in the evening from the upper floors back down to the first floor. Note and record this information in Table 2.

Table 1. Empty Traction Elevator

Empty Elevator Load (N)	Counter-weight Load (N)	Starting Motor Energy (J)

Table 2. Loaded Traction Elevator

Time of Day	Elevator Moving	Elevator Load (N)	Motor Energy (J)
Morning	Up		
Morning	Down		
Evening	Up		
Evening	Down		

Do You Understand?

1. What was the purpose of the traction elevator’s counter-weight?
2. Were there any times or conditions when electrical energy was *not* needed to move the elevator? Please explain your response.