

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_



# Energy Downer

**STEM Sims**

## Lesson 4: Wasted Effort

In a perfect world, machines would be 100% efficient. In other words, all energy placed into a machine would result in useful work. Unfortunately, all machines convert some of their useful energy into waste heat due to friction. Can you find the amount of energy changed into waste heat in this elevator?

### 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. Use the elevator controls and data displays to determine the amount of energy *in joules* converted into waste heat by the elevator system.
4. Use Table 1 to record any relevant data you collected to help determine the amount of “wasted” energy. Make sure to label the data and include units of measure.

**Table 1.**


### Do You Understand?

1. Describe, in detail, how you determined the amount of energy converted into waste heat by the elevator system.

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2. Show all of your calculations for how you determined the amount of energy in joules converted into waste heat. Make sure to show and appropriately cancel out the units of measure.

Amount of energy converted into waste heat (*in joules*) = \_\_\_\_\_