

Grade 4 Science
Week of November 30 – December 4

Conservation

Energy Conservation

One of the most powerful properties of energy is that **Energy is Conserved**.

Energy **never** appears or disappears. Check out the video to see some examples of what energy is in science!



Conservation of Energy: <https://youtu.be/WWhNsxylHbo>

Refrigerators

All the refrigerators in the U.S. consume about the same energy as 25 large power plants produce each year. Don't run a bigger refrigerator than you need. Getting a newer refrigerator to replace your older refrigerator could save you hundreds of dollars per year because they are much more efficient and waste less energy.

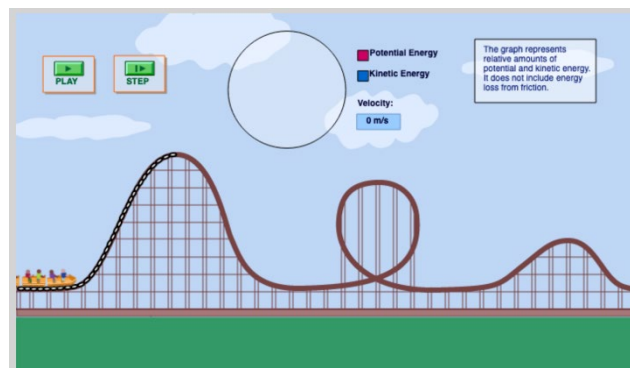
Rollercoaster



Law of Conservation of Energy - <https://youtu.be/LrRdKmjhOgw>

When the rollercoaster is going up it is gaining **potential** energy. When it reaches the top it will have a lot of potential energy. As soon as it starts down the hill it is losing potential energy and gaining **kinetic** energy. The rollercoaster is **not losing or gaining energy** its converting it to a different type of energy!

Click on the picture to activate the rollercoaster.



Potential vs. Kinetic Energy



Potential and Kinetic Energy: <https://youtu.be/aniWJzZVBac>

Facts about energy:

- Energy is most typically measured in **Joules**.
- Food energy can be measured in Joules or Calories.
- Energy can be converted from one form to another.
- Unlike Force or Velocity, energy is a scalar quantity (no direction).

Units for Energy

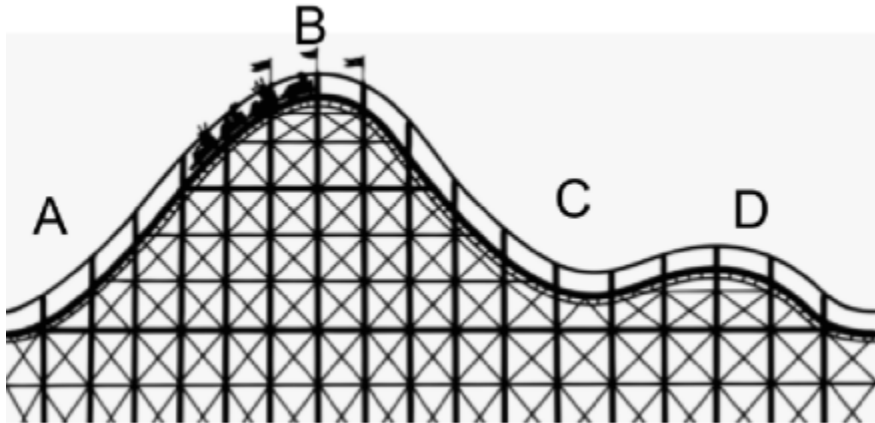
Quote from famous physicist (Richard Feynman, 1964)

For those who want some proof that physicists are human, the proof is the idiocy of all the different units which they use for measuring energy.

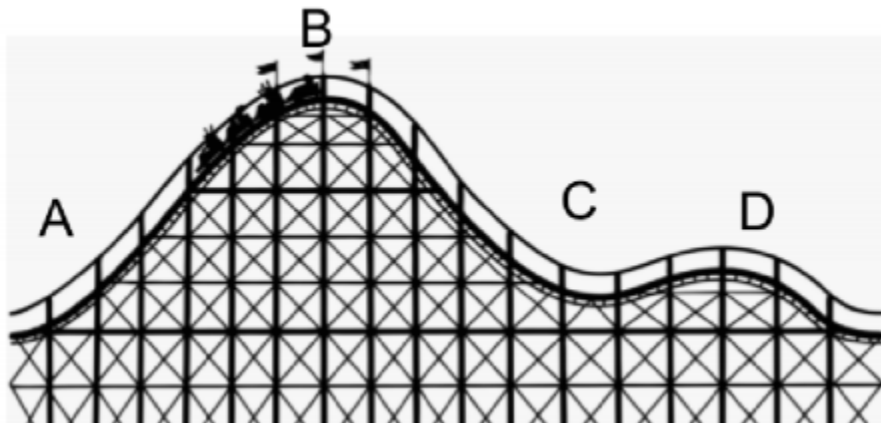
Energy (in all its various forms), has been measured in calories, btu's, foot-pounds, kilowatt-hours, eV, tons of TNT, tons of oil, tons of coal....etc. Any of these can be converted to Joules. In this course, we'll pretty-much stick to Joules when we measure or calculate energy.

Conservation

1. Energy is _____.
2. That means it never appears or _____.
3. A light bulb converts electrical energy to _____ energy.
4. On the following roller coaster circle the letter where there would be the most potential energy:



5. On the following rollercoaster circle the letter where there would be the most kinetic energy:



6. Determine what type of energy is being used, potential, kinetic, or both.

- a. _____ A skier at the top of the mountain.
- b. _____ Gasoline in a storage tank
- c. _____ A race car racing as fast as it can go.
- d. _____ A burning match
- e. _____ A running microwave motor
- f. _____ A flying airplane
- g. _____ A child at the top of a slide
- h. _____ Riding a bike