ENERGY

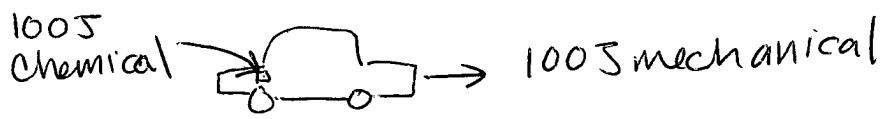
Kinetic (moving)	Potential (stored)
electrical	gravitational
thermal	elastic
Solar	nuclear
mechanical	chemical

Law of Conservation of Energy

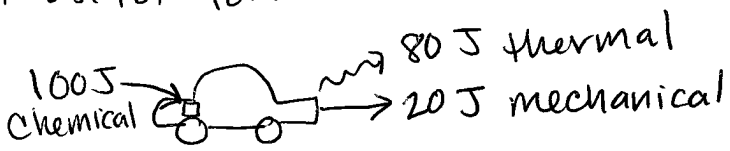
- Energy is never created or destroyed, only transformed from one form to another.

Notes

- energy is measured in Joules (J)
- in an ideal world, energy transformation is 100% efficient



- in the real world, friction transforms some energy into a non-useful form (heat)



- Assume 100% efficiency
- If less than 100%, multiply the input energy by efficiency (as a decimal) to find output energy

Energy Formulas

Work $W = \text{force} \times \text{distance}$ units: $N \cdot m$ = Joules

- a measure of mechanical energy used to move an object.

Kinetic Energy $KE = \frac{1}{2}(\text{mass})(\text{velocity})^2$ units = J

- depends on the speed of the object

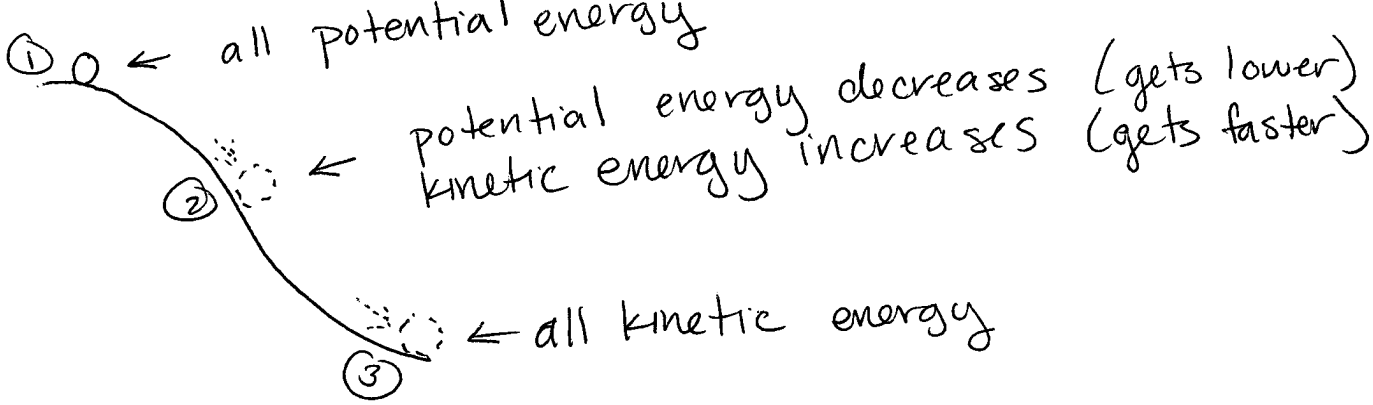
Potential Energy $PE = (\text{mass})(\text{gravity})(\text{height})$ units = J

- depends on the height of the object

Power $P = \frac{\text{work}}{\text{time}}$ units = J/s

- how quickly energy is used

Example: Conservation of Energy



$$\boxed{\begin{aligned} PE &= KE \\ mgh &= \tfrac{1}{2}mv^2 \end{aligned}}$$