Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

**Potential and Kinetic Energy**

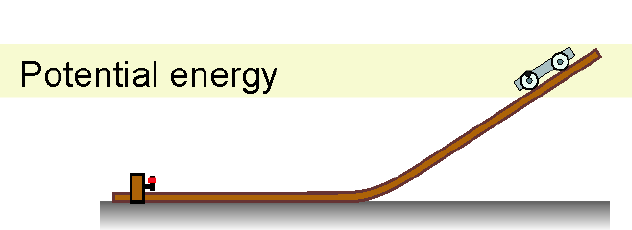
**Do Now:** List as many types of energy as you can remember/ think of.

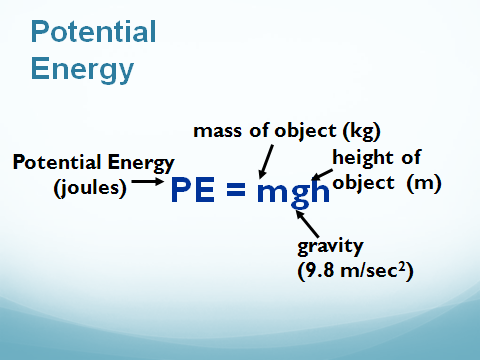
**Notes:**

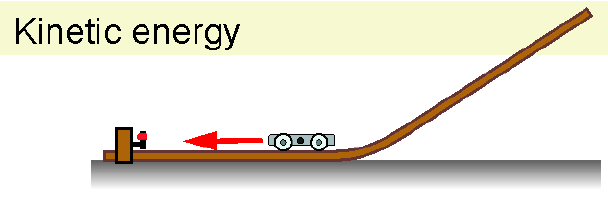
* Energy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Unit: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + *Energy can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
* *Mechanical energy* is the energy possessed by an object due to its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Mechanical energy = Potential Energy + Kinetic Energy

* 2 types of mechanical energy
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Potential Energy:**
* Objects with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *energy* are able to exert forces (exchange energy) as they change \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is energy due to \_\_\_\_\_\_\_\_\_\_\_\_.



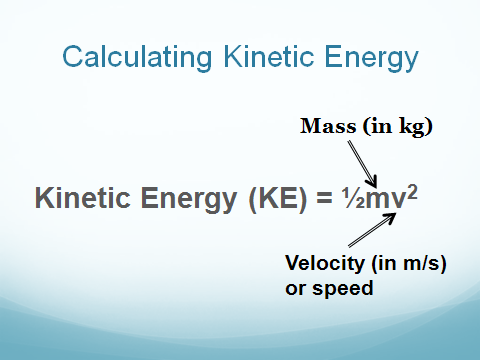


* + The person has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ potential energy at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the stairs than at the bottom.
  + If we dropped an egg from the 2nd floor and the 3rd floor, which would have more potential energy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Example Problems:** 
  + If your egg has a mass of 2 kg, how much potential energy does it hold at a height of 10 meters?
  + A rock weighs 1000 N. What is its potential energy if it located on a shelf that has a height of 5 meters?
* **Kinetic Energy**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Depends on: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Energy of motionis called \_\_\_\_\_\_\_\_\_\_\_\_\_\_*energy.*
  + A moving cart has kinetic energy because it can hit another object and do \_\_\_\_\_\_\_.
  + 
  + Which has more kinetic energy, the regular car at 40 mph or the race car at 120 mph?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + Which would hurt more, getting hit by a 15 foot wave or a 2 foot wave?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



* Example:
  + The bird has a mass of 2 kg. It is flying at a speed of 5 m/s. Find its kinetic energy.
* **Mechanical Energy**

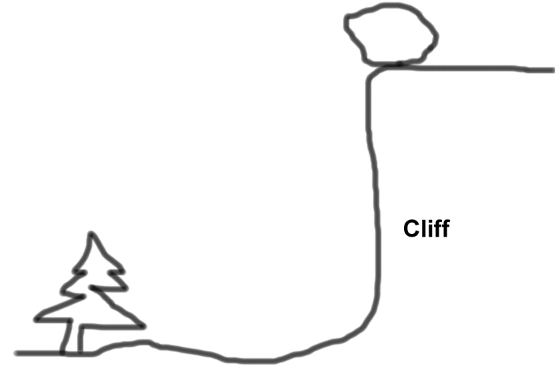
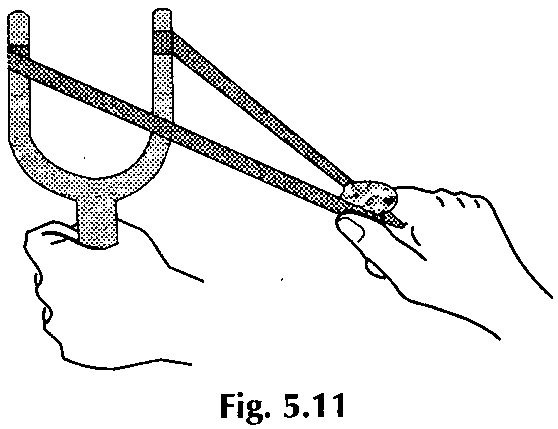
The total amount of energy of an object due to its \_\_\_\_\_\_\_\_\_\_\_\_ or its stored energy of

\_\_\_\_\_\_\_\_\_\_\_\_.

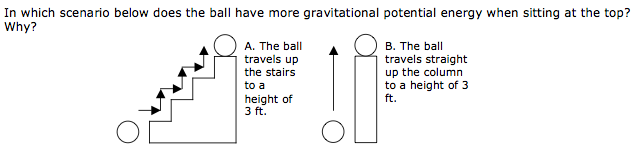
* **Mechanical energy = \_\_\_\_\_\_\_ + \_\_\_\_\_\_\_**

**Practice Problems:**

1. Write either “potential energy” or “kinetic energy” under the following pictures. Explain why you chose your answer.



1. Identify the energy in each statement as kinetic OR potential.
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A mouse running away from a cat.
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A car driving down Route 82.
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A bowling ball rolling down the lane.
2. Determine the amount of potential energy of a 5.0 N- book that is moved to three different shelves on a bookcase. The height of each shelf is 1.0m, 1.5m, and 2.0m.
   1. Potential energy at 1.0 m \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Potential energy at 1.5 m \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Potential energy at 2.0 m \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. A 1.0 kg ball is thrown into the air with an initial velocity of 30 m/s.
   1. How much kinetic energy does the ball have?
   2. How much potential energy does the ball have when it reaches the top of its ascent?
4. You are on skates at the top of a small hill. The height of the hill is 1.7 meters. The last time you checked, your mass was 60.kg.
   1. What is your weight in Newtons?
   2. What is your potential energy at the top of the hill?
5. What is the kinetic energy of a 2,000-kg bat moving at 5.0 m/s?
6. A man with a mass of 80 kg is standing on the edge of a table 1.5 m above the ground. What is the man’s potential energy?



1. A 70-kg man is walking at a speed of 2.0 m/s. What is his kinetic energy?
2. A 1-kg rock is at a height of 100 meters.
   1. What is the rock’s gravitational potential energy at 100 meters high?
   2. Calculate the rock’s gravitational potential energy at 50 m, 20 m, 1m, 0 m high. Put the answers in the data table below.

|  |  |
| --- | --- |
| **Height (m)** | **Potential energy (J)** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

* 1. Make a graph of height versus energy.

