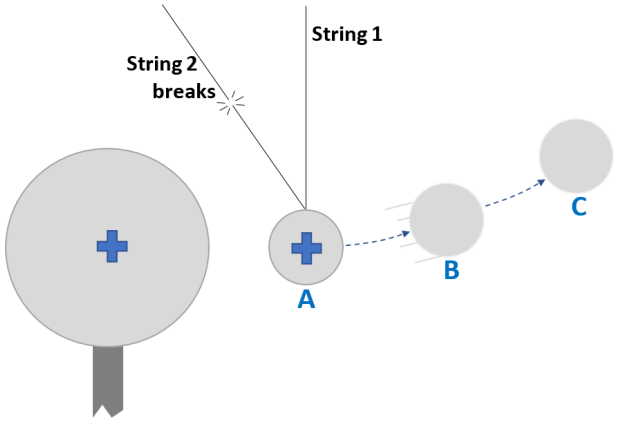
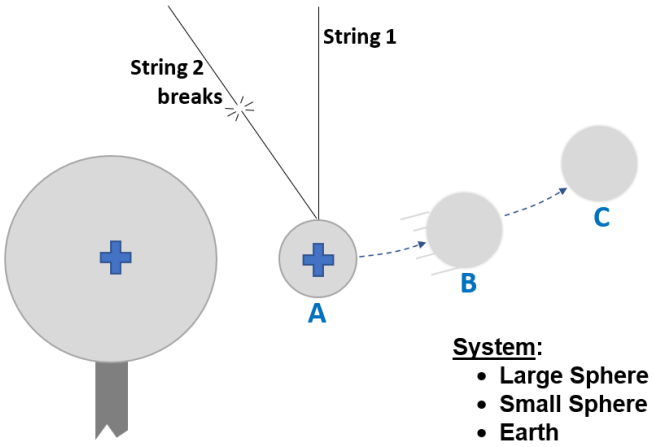
Activity 1: Modeling Force in Electric Fields

A large, positive sphere is to the left of a small, positive sphere suspended by two strings as shown. String 1 is initially vertical. When String 2 suddenly breaks, the small sphere swings from position A to B to C before momentarily coming to rest. $\mathbf{F_e}$ represents the electric force on the small sphere; **d** is the distance between the large and small spheres.



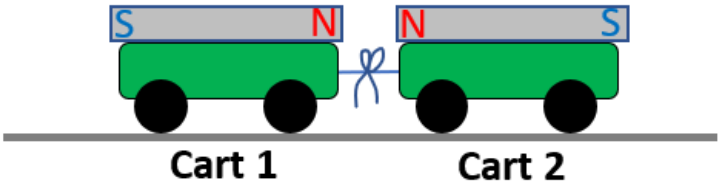
Activity 2: Modeling Energy in Electric Fields

A large, positive sphere is to the left of a small, positive sphere suspended by two strings as shown. String 1 is initially vertical. When String 2 suddenly breaks, the small sphere swings from position A to B to C before coming momentarily to rest. **KE, Grav PE**, and **Elec PE** represent the system's kinetic energy, gravitational potential energy, and electric potential energy respectively. **d** is the distance between the large and small spheres.



Activity 3: Modeling Force in Magnetic Fields

Two identical carts (Cart 1 and Cart 2) each have a bar magnet attached as shown. A string holds the two carts together on a horizontal track that **does** offer some friction.

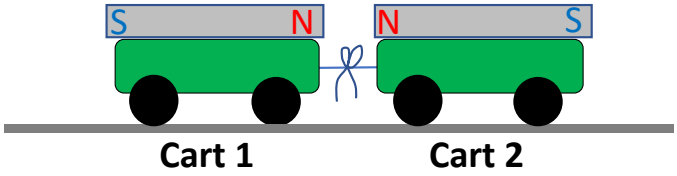


The string is then cut at t=0 sec.

$\mathbf{F_m}$, $\mathbf{F_f}$, and **d** represent the magnetic force, force of friction, and distance between the two carts respectively.

Activity 4: Modeling Energy in Magnetic Fields

Two identical carts (Cart 1 and Cart 2) each have a bar magnet attached as shown. A string holds the two carts together on a horizontal track that **does** offer some friction.



The string is then cut at t=0 sec. **KE, Mag PE**, and **Thermal** represent the system's kinetic energy, magnetic potential energy, and thermal energy respectively. $\mathbf{d_o}$ is the initial distance between carts and **d** is the distance between the two carts at any later time.

System:

- Both Carts with Magnets
- Track
- Earth