

Exploring Energy – Lab

Purpose

What types of energy, energy transfer, and energy transformations can you identify?

Materials

Listed at each station

Pre-lab discussion:

1. What do you think is the definition of energy?
2. What do you understand by a system?
3. How would you define an open system?
4. How would you define a closed system?

Directions:

Observe what happens at each station and write a description of the initial state, final state of the system and the process it underwent. Fill out the table below.

Station	Initial state	Final state	What happened?	Why did it happen?

Station 1: Acids and Bases (goggles required, one trial per group).

Please read all directions before starting. Place 1/3 of a teaspoon of baking soda (base) in a small facial tissue wrapper. Have the film canister lid ready. Pour 20 mL of Vinegar (acid) into the film canister. Add the tissue packet with the baking soda into the film canister and quickly replace the cap. Drop the closed film canister into the clear jar. You need to move quickly on this one. Stay clear of the jar opening. Make observations (please view from the side).

Station 2: Fire Cheetos on Fire (goggles required, one trial per group).

Place one piece of Cheeto into the aluminum pie pan. Using the lighter wand, attempt to ignite the Cheeto. You may find it easier to ignite the Cheeto by maneuvering the flame to an internal surface of the Cheeto. Make observations.

Station 3: Squeeze Flashlight

Hold the flashlight in your hand and watch the light bulb. Squeeze the handle slowly at first, then more quickly. Make observations.

Station 4: Squeeze LED

Hold the LED in your hand and watch the light bulb. Squeeze the handle once. Make observations.

Station 5: Wind Up Toy

Wind the toy. Be gentle. It only takes a few twists. Place the toy on the tabletop and release. Make observations.

Station 6: Colliding spheres

Hold a piece of paper between the two steel spheres and make them collide such that the paper is between the two spheres. Make observations.

Station 7: Astroblaster (goggles required).

Drop the smaller ball from chest height. Observe. Drop the bigger ball from chest height. Observe. Please stack the smaller ball on top of the bigger ball. Release the balls simultaneously so that they may fall together. Make observations.

Station 8: Jumping Disks

Take the plastic half ball and invert it (bend it the other way around). Either place it on the table and watch it or release it such that it falls perpendicularly on the ground with the curved side down. Watch and make observations.

Station 9: Spring Car

Place the toy car on the floor. Please wind the toy car by gently pressing down on the car and rolling it backwards just a few centimeters and release. Make observations.

Station 10: Rubbing Hands

With your palms together, compress your palms and fingers. Rub your hands, alternating up and down for several seconds. Place your hands on your cheeks. Make observations.