

Energy Conservation and Transfer — Exploring Energy through Technology

Try this! (1-2 minutes)

1. Rub your palms in a forward and backward motion while together. What happens?
2. What does this tell us about energy?
3. What happens to the energy once you stop? Where does it go?

What's going on?

We create friction by rubbing our hands together. All things have friction, even smooth appearing surfaces. Friction is the attraction between the atoms in each object. Friction causes kinetic energy (rubbing your hands together) to convert to heat energy. We demonstrated the theory of conservation of energy, which states energy cannot be created nor destroyed, only transferred.

<http://scienceforkids.kidipede.com/physics/machines/friction.htm>



Hand Movement

Now try this! (5 minutes)

1. Use the provided Soccket ball to harvest energy from movement by kicking it around several times
2. Plug in the LED light. How much energy do you think you created?
3. Why is this useful?

What's going on?

One hour of play will produce up to three hours of LED power. The Soccket ball generates energy by rolling. The rolling turns pendulum which causes the DC motor to charge. The DC motor uses an inductive coil to harvest energy from movement. This means that by turning the coil around the motor (or a magnet) you produce a constant flow of current that charges the battery. It works in a similar fashion of a windmill. The more the ball rolls the more energy it harvests.

<https://www.youtube.com/watch?v=hzchNIVqjQ4>



Soccket Ball

How is this ASSIST?



Children playing with a Soccket ball

The Soccket ball is a great tool to demonstrate energy harvesting. The ASSIST Center focuses on energy harvesting for wearable devices. It uses energy harvesting to provide electricity to areas that do not have reliable access. It also encourages physical movement, which can prevent obesity. The Soccket uses a microprocessor, pendulum, and a dc motor to collect kinetic energy and convert it to electrical energy to be used with a LED light.

Learning Objectives

1. Participants will understand conservation of energy.
2. Participants will understand energy harvesting.

Materials

- Willing participants
- Soccket ball and accessories

Notes to the presenter

Before doing this activity, please do the following:

- Ensure that Soccket ball is in working order
- Reserve a large area for use of the Soccket ball

SAFETY: Be aware of physical limitations, if need be the ball can be rolled across the floor of a classroom for demonstration. The ball should stay below knee height.

Cleanup: No clean up should be needed.

Related educational resources

For further research:

- *The Soccket Website*- <http://unchartedplay.com/>
- *The ASSIST Center*- <http://assist.ncsu.edu/>
- *Energy Harvesting*- <http://www.iop.org/resources/energy/>
- *Renewable Energies*- <http://energy.gov/science-innovation/energy-sources/renewable-energy>

Credits and rights

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