SCIENCE CAREER ADVENTURES

Turning Kinetic Energy Into Electricity

Take a look at how kinetic energy is turned into electricity!

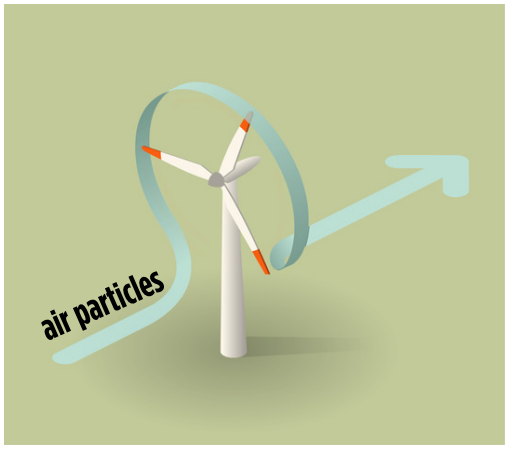
Step 1:
A turbine is a device that has blades and can spin.

Wind Turbine

Water Turbine

Step 2:
The turbine is placed somewhere where there are moving particles that can be a source of kinetic energy. (Example: Blowing winds or flowing water)

Step 3:
The moving particles hit the blades of the turbine to make it spin. (Example: Air particles, water particles)



Step 4:
When the moving particles hit the turbine, some of their kinetic energy, or energy from motion, transfers to the turbine.

Step 5:
The turbine is attached to a generator that can change kinetic energy into electricity that can power homes and businesses.

Kinetic energy is changed into electrical energy.

Examples of Ways Kinetic Energy is Converted into Electricity in Cities

Check out these ways that cities are turning kinetic energy into electricity!

Soccer balls during soccer game

- A small sensor that works like a turbine is placed inside the soccer ball.
- Every time the soccer ball is kicked or bounces, some of its kinetic energy makes the sensor inside the ball spin and create electricity.
- Because the ball is transferring some of its kinetic energy to the sensor, the ball will move slower than it would without the sensor.

Gym equipment during workouts

- Exercise bikes and treadmills are attached to small turbines.
- Every time a person rides the bike or walks on the treadmill, the turbine spins and creates electricity.
- Because the person is transferring some of their kinetic energy to the bike, they will move slower (or they will need to use a little more of their own stored energy to keep moving fast). However, most people don't mind having to use extra energy to go faster and make even more electricity.

Floors in shopping malls or other busy areas

- Special materials that are like solar cells are placed below the tiles that line the floor in shopping malls.
- Every time a person steps on the tile, the kinetic energy from that step is captured to making electricity flow in the special materials.
- Because the person is transferring some of their kinetic energy to the tile, they will move slower (or they will need to use a little more of their own stored energy to keep moving fast). However, most people don't mind working a little harder to walk somewhere when they know they are creating electricity!

Creating a Device

Step 1: Select an Area

You will first select an area in a city where kinetic energy is found but not used. Choose one location from the list or come up with your own idea. If you come up with your own idea, you must get approval from your teacher before moving on to the next step.

A recycling center where people dump their recycle bins into a large dumpster.

Movie theater where hundreds of people open and close the doors each day.

Basketball court where kids play basketball after school.

Something else!
Don't forget to get approval from your teacher!

Step 2: Brainstorm and Sketch

You will now design a device that will spin to convert kinetic energy into electricity in the area you selected.

Think about the following:

- What person or object is moving? By knowing what person or object is moving, you can figure out how you are going to capture the motion.
- How is the motion from the person or object going to get transferred to your device?
- What part of the device will spin to create electricity?

Sketch your device below. Label important parts that show how kinetic energy will be turned into electricity.

Step 3: Build a Prototype

Use art supplies to build a prototype of your device.