



GRADES 3-5

ACTIVITY 1 POWERING HISTORY

Planet Power is a fascinating film that follows the amazing journey of Solar Impulse 2, a plane powered only by sunlight, as it is flown around the world by Bertrand Piccard and André Borschberg. Solar Impulse 2 captures sunlight to produce electricity that powers its motors and on-board equipment, the same energy source we depend on to power almost everything that is part of our lives.

Part 1. In **Planet Power**, we learn that it took scientists and inventors hundreds of years to understand and harness the power of electricity. Use this timeline to identify the benefits of some key developments in this process of discovery. Write the letter of each benefit at right in front of the corresponding development.

DEVELOPMENT

1. ___ 1749: Benjamin Franklin proved that lightning was electrical, and used a kite and long metal rod to harness its power for the first time.
2. ___ 1800: Alessandro Volta invented the first battery using chemicals and a stack of metal discs.
3. ___ 1821-1831: Michael Faraday built the first motor using a magnet and electricity. Ten years later, he reversed his experiment and used magnets and motion to generate electricity.
4. ___ 1838: Artist Samuel Morse found a way to send electrical signals along copper wires.
5. ___ 1880: Thomas Edison created the first modern light bulb.
6. ___ 1882: Nikola Tesla built an "alternating current" system to bring electricity across long distances to people's homes.
7. ___ 1954: Scientists made the first solar panels that could power a device for several hours.
8. ___ 2016: Bertrand Piccard and André Borschberg were the first to fly a plane all the way around the world using *only* solar power instead of burning fossil fuels.

BENEFITS

- A. It has taken decades to start using solar energy to its potential.
- B. The discovery that an electric current could be created and maintained with chemicals and different metals opened the door for further research.
- C. Electric light allowed people to work past sundown and in spaces without windows, like factories and large office buildings. Just imagine a bathroom or shopping mall without electric lights!
- D. Morse code allowed people to send long-distance messages much faster than written letters carried by horse or across the ocean on a ship.
- E. The lightning rod allowed electricity to be directed away from buildings and people, helping to prevent fires and injuries.
- F. With electricity in every home came many new ways to keep people safe, like refrigeration of food and medicine, as well as fun stuff like radios and television.
- G. The early motor and generator demonstrated the relationship between kinetic energy and electricity. Modern power plants still work on this principle.
- H. Solar Impulse 2 has proved that we *can* cut our world's energy consumption in half, save natural resources, and improve our quality of life.

Part 2. In **Planet Power**, we are challenged to consider the balance between our reliance on electrical power and the need to protect and preserve our environment. One way to tip that balance favorably is to reduce our energy consumption. On the back of this sheet, make a list of your daily and weekly activities that use electricity. That includes every time you microwave a snack or play a video game. You may need to ask your parents for help with items like laundry and air conditioning.

To find out how much this adds up to, go to <https://www.pacificpower.net/res/sem/eeti/euc.html> and enter the items from your list. Are you surprised? How does your energy consumption compare to that of your classmates? List three things you can do *today* to use less energy.

1. _____ 2. _____ 3. _____

MATH CHALLENGES

1. Your teacher will give you a map that shows the cities where Solar Impulse 2 landed on its flight around the world. On a separate sheet of paper, draw a chart like the one below to show the approximate distances the plane traveled between each city. Then show the total number of miles the plane flew on its around-the-world flight.

City 1	City 2	Distance
City 2	City 3	Distance

TOTAL miles: _____

2. By using only the power of the sun to fly, Solar Impulse 2 was very different from a regular jet fuel-powered airplane. For example, a jet plane on an international flight burns around 5 gallons of fuel each mile it flies. Pick two stages in the journey of Solar Impulse 2, and calculate how much fuel a regular international jet would have burned to travel between those two cities.

From	to	Distance	Gallons of Fuel
From	to	Distance	Gallons of Fuel

3. Now calculate how much fuel a jet airplane would use to travel the total distance Solar Impulse 2 flew on its journey around the world.

Total distance: _____ miles x 5 gallons of fuel per mile = _____ gallons of fuel