



Concept:

As the bicycle is pedaled, a belt connected to its rear rim is coupled to the axle of a generator. As the axle and the wire coils attached to them rotate, the coils inside the generator experience a changing magnetic flux in the field of permanent magnets. A current is thus created via Faraday's induction law. This current ultimately lights the bulbs. This demo is also a provocative illustration of energy conversion; the potential energy stored in the chemical bonds of the rider's food is converted to kinetic energy of the bike wheel, and ultimately converted to the electrical energy required to light the bulbs and to the heat dissipated by the rider and light bulbs. A rider can easily light all six bulbs (650 W ~ 1 HP), but cannot easily sustain this peak power output for more than several seconds.

Procedure:

1. Verify that the bicycle generator is attached to the light bulb board with the two banana-banana cables, the bicycle seat is adjusted to the correct height for the rider and the highest gear is selected.
2. With the light bulb switches off, demonstrate that there is little resistance when pedaling the bicycle.
3. Turn the light bulb switches on one at a time, noting that, with each added light bulb in the circuit, more pedaling power is required to generate enough current to light the bulbs.

Equipment:

- Bicycle Generator Apparatus
- (2) Banana-Banana Cables
- Light Bulb Board with:
 - (5) 100W Bulbs
 - 150W Bulb