

Laws of Physics Electricity/Magnetism

This apparatus produced by LORD Co. www.lordequip.com illustrates two laws of physics. One is that when an electrical current is passed through a coil a magnetic field is created. The second is that when a magnet (or magnetic field) is passed through a coil, electricity is created.

Electricity Passing through a Coil of Wire

If the electrical circuit is completed on the apparatus by touching the bare end of the wire to the top of the battery the iron rod will become a magnet because of the wire coiled around it. This can be proved because the rod will attract other iron objects. The most impressive example of this can be seen by the work of large “electromagnets” that are used in junk yards. They are attached to end of cranes and used to pick up junk cars and trucks and other scrap metal to move them from one place to another. This is convenient because the automobile or scrap iron can be dropped at will just by stopping the electricity through the coil that is inside the electromagnet. The most important aspect of electricity’s ability to create a magnet is found in the everyday life of families, businesses and civilization as a whole. This is because the electro-magnet is the heart of the electric motor and electric motors make living on this planet Earth easier in thousands of ways. Without electricity passing through coils, our cars or trucks wouldn’t start, refrigerators wouldn’t get cold, electric tools wouldn’t work, computers would overheat, air conditioning would stop, most kitchen appliances wouldn’t work and electric toothbrushes would never have been invented.

A Magnetic Field passing through a Coil of Wire

A magnet passing through a coil of wire will create electricity. This can be seen inside the flashlight attached to the apparatus. By shaking the flashlight back and forth, it can be observed that a silver hunk of metal (a “permanent magnet”) is moving back and forth through a copper coil of wire. (This magnet may be shown to produce a magnetic field because it will attract small iron objects like

a paper clip even through the clear plastic casing of the flashlight.) As the magnet passes through the coil a red light will flicker showing that an electrical current is being produced. This means electricity is being “generated”. Extended time allotted to shaking the magnet back and forth through the coil in the flashlight will charge the flashlight’s storage cell for the operation of the flashlight. The most impressive operation of this principle might be seen at Hoover Dam where the falling water turns gigantic “generators” to create electricity for thousands of homes and businesses. The reason generators work can be seen in the flashlight connected to the apparatus. Inside the generators at Hoover Dam there are large magnets being rotated through large coils of wire. Without generators none of the light bulbs in homes would light up. Houses would be dark as soon as the sun sets at night. There are smaller generators in cars and trucks. Windshield wipers, radio, lights, GPS devices, cell phone chargers would all quit working without the generator.

One could almost say that without the two applications of electricity and magnetism shown in the apparatus, all of civilization would still be living much in the same way as it was in the Dark Ages of history.