Lesson Notes:

Moving electrons with a magnet

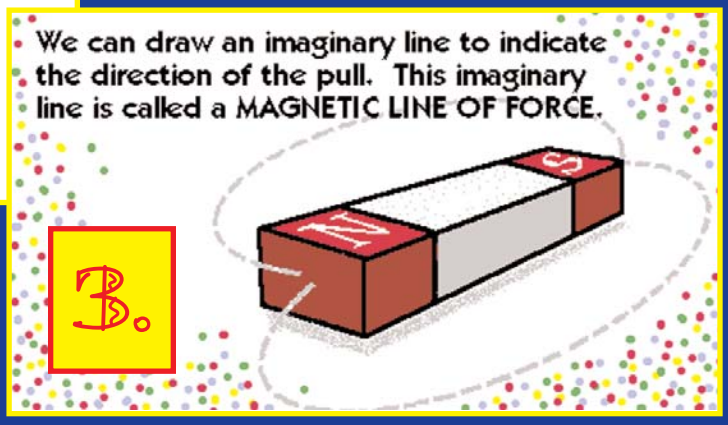
Electric UNIVERSE

1. Start by playing with magnets. Several characteristics of magnets quickly become obvious. Demonstrate these.

- Magnets will attract metals— especially iron and alloys containing iron.
- Magnets come in a variety of shapes and sizes.
- All magnets have a north pole and a south pole.
- North and south poles attract, or pull toward, each other.
- Two north poles or two south poles repel, or push away, from each other.
- A magnet's force acts through space or other objects. (Demonstrate by holding a magnet under a sheet of paper while moving a paper clip on top of the paper. Also move a paper clip with a magnet without actually touching the magent to the clip.)

2. Demonstrate that a magnet pulls in different directions around itself by moving a compass around a magent. Show how the compass needle changes direction as you move it. The compass needle is actually a second magnet, and its poles are attracted to the opposite poles of the magnet.

3.



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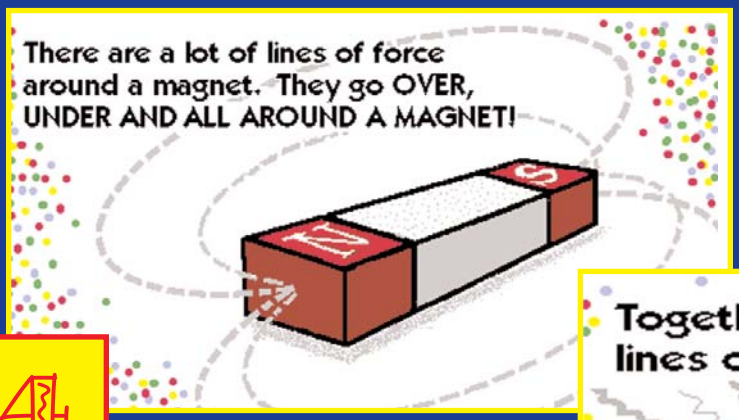

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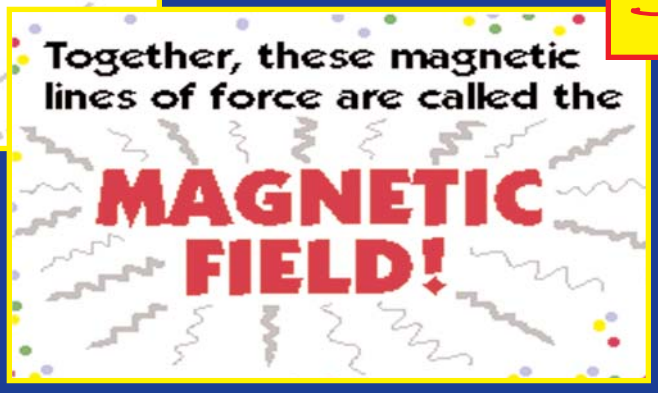
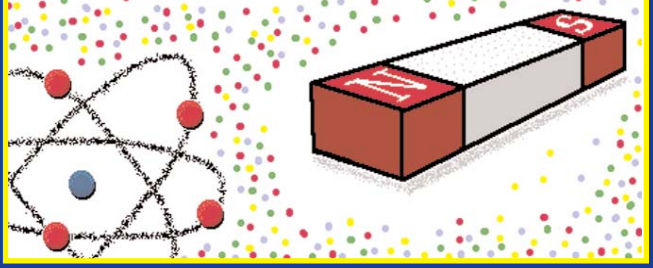


6.

We saw how objects containing iron can be moved by magnets.

Electrons can also be moved by magnets.

Magnets can be used to make electricity.



7.

When a wire passes through a magnetic field, the force of the magnet causes the electrons of the LOOSE ATOMS in the wire to start moving.

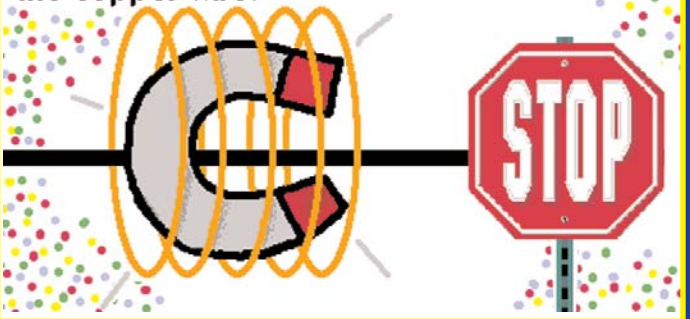
In this way an electrical current is started.

8.

An electric current can also be started when a magnet turns inside a coil of wire.

9.

When the magnet stops moving, the electrons stop moving in the copper wire.



10.

REMEMBER that magnets can be used to make an electrical current by pushing electrons down a wire.
This process is called INDUCTION.

Science Words to Discuss

• Magnet • North Pole • South Pole • Attract • Repel • Magnetic Lines of Force • Magnetic Field • Electrons • Loose Atoms (Electrical Conductors) • Electrical Current • Generator • Induction •

Pre & Post Lesson Questions

What are magnets? Name some of the different shapes of magnets.

How many different places do you see magnets used every day?

What kinds of things stick to magnets?

Can a magnet work through something else?

What are the two ends of a magnet called?

Can two magnets pull toward each other?

Can two magnets push away from each other?

Can the pull of a magnet change direction?

Can a magnet make electricity? If so, how does it accomplish this?

What is the word that describes moving electrons with a magnet?

Linked Experiments

Build a galvanometer • Generate a current with a solonoid