

LIGHTNING COIL

Objectives:

The students will understand:

- How to collect data and determine varying outcomes reliant upon the input of information
- That models can be representatives of something else
- Anyone can be a scientist and test hypotheses
- How simple circuits work and how they are associated with the transfer of electrical energy
- That there is a relationship between magnetism and electricity

Standards Assessed:

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| • Scientific Method | • Models for Representation |
| • Collecting Data | • Potential and Kinetic Energy |
| • Scientific Inquiry | • Energy Transfer |
| • Testing Hypothesis | • Simple Circuits |

New York Standards:

K: S1.1a, S1.2.3, S1.3, S1.3.2, PS4.1c, PS4.1e, PS5.1e
1st: S1.1a, S1.2.3, S1.3, S1.3.2, PS4.1c, PS4.1e, PS5.1e
2nd: S1.1a, S1.2.3, S1.3, S1.3.2, PS4.1c, PS4.1e, PS5.1e
3rd: S1.1a, S1.2.3, S1.3, S1.3.2, PS4.1c, PS4.1e, PS5.1e
4th: S1.1a, S1.2.3, S1.3, S1.3.2, PS4.1c, PS4.1e, PS5.1e
5th: S1.1.2, S1.2a, S1.2b, S2.2b, PS1.1e, PS4.4d, PS4.4e
6th: S1.1.2, S1.2a, S1.2b, S2.2b, PS1.1e, PS4.4d, PS4.4e
7th: S1.1.2, S1.2a, S1.2b, S2.2b, PS1.1e, PS4.4d, PS4.4e
8th: S1.1.2, S1.2a, S1.2b, S2.2b, PS1.1e, PS4.4d, PS4.4e

Materials:

- Lightning Coil Exhibit

LIGHTNING COIL

Procedures:

Students will place their hand inside a chain-link metal glove. With the other hand they can press the button or have an adult help. Have students hypothesize why the spark forms, and why it reaches to their hand. In the classroom, begin a discussion about what is taking place involving electrons, the attraction of electricity to the glove, and the completion of the circuit that takes place when the button is pushed. Why is it that the spark does not shock you? What safety procedures should be followed around electricity at home and in all other situations? An explanation of the exchanges between Thomas Edison and Nikola Tesla about these two kinds of electricity can be included. What is the difference between a/c and d/c current? What differed between Tesla's and Edison's versions of electromagnets and what were the results of those differences?

Independent Practice:

The exhibit is completely independent.

Assessment:

- Observation of the students with the exhibit
- Teacher observation of participation in classroom discussion
- Score on WonderWorks test

Modifications (Special Education Students):

Special education students may need assistance with placing their hand into the glove.

Extensions (Gifted Students):

Gifted students can explore what other uses can be found for Tesla's form of producing electric current.

Generalization to Other Subjects:

Safety can be generalized to all other subjects.