Electric

June 2020
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Understanding Electricity

- Acquire knowledge regarding efficient utilization of electric energy through the production of heat, light, power communications and computers
- Choose a career in electric and allied industries and research the education and training required to enter that career
- Increase the public's awareness, concern, and knowledge of generating and using electricity
- Develop models that demonstrate the transmission and distribution of electric energy
- Apply Ohm's Law and Kirchhoff's Laws to solving given problems in electrical circuits
- Examine a residential wiring system and explain the layout and the basic function of each component in the system

Safety

- Research current OSHA standards and other regulations specific to job-site electrical safety to identify methods and equipment to reduce the risk of injury due to electrical shock
- Create a visual display an apprentice electrician might use to interpret the meaning of color and markings on conductors
- Describe the purpose and layout of the National Electrical Code (NEC ©)
- Evaluate and recommend proper electrical hardware for a residential building

Magnets

- Compare and diagrammatically represent both electric and magnetic fields
- Research methods and devices used to measure characteristics across the electromagnetic spectrum
- Research and communicate scientific explanations about how electromagnetic waves are used in modern technology to produce, transmit, receive, and store information

Circuits

- Develop a model (sketch, CAD drawing, etc.) of a resistor circuit or capacitor circuit and use it to illustrate the behavior of electrons, electrical charge, and energy transfer
- Demonstrate Ohm's Law through the design and construction of simple series and parallel circuits
- Develop and implement a troubleshooting strategy to test and remedy an electrical fault in an electrical system
- Demonstrate proper techniques for soldering electronic circuits
- Compare and contrast the difference between analogue and digital circuits
- Design a combinational digital logic circuit using logic gates

Machinery

- Build a device within design constraints that has a series of simple machines to transfer energy and/or do mechanical work
- Communicate information about energy efficiency and/or inefficiency of machines used in everyday life