

## Electrical Wiring, Plumbing and Concrete

Course Description: This class will give students a hands-on experience into wiring household and agricultural type circuits (single pole switches, 3-way switches, 4-way switches, half-hot receptacles and GFCI receptacles) along with understanding the workings of a parallel vs series circuit, the voltage requirements of a system and careers involved in the generation and transmission of electricity. **The electrical unit will last approximately one quarter.** Then students will learn about the supply and drain-waste-vent plumbing system. Plastic pipes--construction of a PVC project involving preparing and cementing and PEX. Galvanized pipes--learning to thread a pipe. Copper pipes--soldering techniques. If time permits, we will work on an underground sprinkler system. Lastly, students will be exposed to concrete unit where we will look at strength and components along with admixtures that slow and speed up reaction times. We will mix up different strengths and do a slump test. An after school visit to Little Falls Ready-Mix will be offered to all students.

Grading will be as follows:

|         |   |
|---------|---|
| 94-100% | A |
| 84-95%  | B |
| 74-85%  | C |
| 64-75%  | D |
| <64%    | F |

Students will be expected to come to class prepared-cell phones may only be used when directed. Please leave the classroom cleaner than you found it. Students will have numerous opportunities to work independently. Please enjoy and learn!

### Electrical Unit

#### Week 1

- History of electricity--Edison, Tesla
- Types of light bulbs
- What is electricity?
- Safety

#### Week 2

- Resistance
- Volts, watts, amps defined and math equation
- Using a voltmeter
- Using a killawatt

#### Week 3

- Diagramming an electrical circuit

Parallel vs Series circuits

Week 4

What is a battery and how does it work?

Single Pole Switches

Week 5

3-way switches

Switch legs

Types of wire

4-way switches

Week 6

Receptacles

Half-hot receptacles

Week 7

Electrical Motors

Week 8

Transmission and generation of Electricity

Energy type careers

Week 9

Electrical final

## **Plumbing**

Week 1

Introduction to supply, drain-waste-vent systems

Diagramming a plumbing system

Plastic pipe

Week 2

Galvanized pipe--threading a pipe

Copper pipe--soldering

Week 3

Plumbing diagrammed

Using plumbing tape-toilet and shower head repair

Scale drawings, geothermal

Troubleshooting and maintenance of plumbing systems

## **Concrete**

### Week 1

- Concrete composition
- Fly ash--what is it? Good or bad?
- Types of sand
- Admixtures

### Week 2

- Safety
- Slump test
- Strengths--uses for 2000 psi, 3000 psi and 4500 psi

### Week 3

- Concrete projects using pea rock and coloring
- Concrete tools
- Use and care of concrete

### Week 4

- Concrete careers
- Concrete job proposals