Unit 8: Advance Residential Electrical and Plumbing

Content Area: **Industrial Technology**
Course(s): **Construction Technology II**
Time Period: **4th Marking Period**
Length: **Weeks**
Status: **Published**

Unit Overview

Students will be able to install a more advanced electrical circuit in the framed wall of the shed they have already constructed and identify how electric is distributed through a house and components. Student will be able to identify how plumbing is distributed through a house and components.

Transfer

Students will be able to independently use their learning to...

-Repair Electrical and Plumbing Components in their house or further their education to become a licensed Electrician or Plumber.

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

Meaning

Student will be able to safely repair small electrical or plumbing projects in their home or they may want to pursue a career in the Electrical or Plumbing Field.

Understandings

Students will understand that...

-They can save money or earn money by repairing more advance electrical or plumbing themselves.

That the Electrical and Plumbing trades are in need of qualified technicians and they can earn money if they select this field as a Career.

Essential Questions

Students will keep considering...

-What are the dangers and safety hazards when working with Electricity or Water?

Is the Electrical or Plumbing Field a career I would like to pursue in the future.

Application of Knowledge and Skill

SWBAT drill holes and run wires through their framed walls in the shed they have completed to complete a more advance electricl circuit.

SWBAT identify how electricity flows through a house.

SWBAT identify how water flows through a house and is removed.

Students will know...

Students will know...

What facts and basic concepts should students know and be able to recall?

How electricity flows through a house.

How water flows through a house and is removed

How to install electrical components. ie: GFCI protected Receptacle, Switch, 3 way and 4 way switches, Light.

How to install plumbing fixtures. ie: Sink with Faucet, Tub with Faucets, Toilet valves.

Tools that are specifice to the Plumbing and Electrical Trades.

Safety when working with Electricity or Water.

Students will be skilled at...

Students will be skilled at...

Installation of Electrical and Plumbing Components.

Safe operation of Electric and Plumbing Tools along with various types of Electrical Testers.

Running Electrical Wires and Plumbing Pipes in a house.

Academic Vocabulary

Voltage, Amperage, Resistance, Wire Gauge, Electrical Load, Professional Unions, GFCI Receptacles, 3 way switch, 4 way switch.

Learning Goal 1

More advanced electrical components and plummbing components for outside installations.

9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.
9.3.12.AC.2	Use architecture and construction skills to create and manage a project.
9.3.12.AC.3	Comply with regulations and applicable codes to establish and manage a legal and safe workplace.
9.3.12.AC.4	Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.
9.3.12.AC.5	Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.
9.3.12.AC.7	Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.
9.3.12.AC-CST.1	Describe contractual relationships between all parties involved in the building process.
9.3.12.AC-CST.2	Describe the approval procedures required for successful completion of a construction project.
9.3.12.AC-CST.3	Implement testing and inspection procedures to ensure successful completion of a construction project.

9.3.12.AC-CST.7	Compare and contrast the building systems and components required for a construction project.
9.3.12.AC-CST.8	Demonstrate the construction crafts required for each phase of a construction project.
9.3.12.AC-CST.9	Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
9.3.12.AC-DES.4	Apply building codes, laws and rules in the project design.
9.3.12.AC-MO.2	Use troubleshooting procedures when solving a maintenance problem in buildings.

Target 1

SWBAT identify the methods electrical power in a three way or four way switch travels in a residence.

Target 2

SWBAT identify the different method a Ground Fault switch works in a residence or wet location.

Learning Goal 2

Electric Circuitry and Electric Testing.

9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.
9.3.12.AC.2	Use architecture and construction skills to create and manage a project.
9.3.12.AC.3	Comply with regulations and applicable codes to establish and manage a legal and safe workplace.
9.3.12.AC.4	Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.
9.3.12.AC.5	Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.
9.3.12.AC.6	Read, interpret and use technical drawings, documents and specifications to plan a project.
9.3.12.AC.7	Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.
9.3.12.AC-CST.1	Describe contractual relationships between all parties involved in the building process.
9.3.12.AC-CST.2	Describe the approval procedures required for successful completion of a construction project.
9.3.12.AC-CST.5	Apply practices and procedures required to maintain jobsite safety.

9.3.12.AC-CST.7	Compare and contrast the building systems and components required for a construction project.
9.3.12.AC-CST.8	Demonstrate the construction crafts required for each phase of a construction project.
9.3.12.AC-CST.9	Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
9.3.12.AC-DES.2	Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.
9.3.12.AC-DES.4	Apply building codes, laws and rules in the project design.
9.3.12.AC-DES.8	Apply standards, applications and restrictions pertaining to the selection and use of construction materials, components and assemblies in the project design.
9.3.12.AC-MO.3	Apply construction skills when repairing, restoring or renovating existing buildings.
9.3.12.AC-MO.4	Determine work required to repair or renovate an existing building.

Target 1

SWBAT to identify how elecricity flows through a circuit in series and parallel and how to operate various electrical testers to test for and drouble shoot a electrical problem.

Learning Goal 3

Residential Plumbing System and Components.

9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.
9.3.12.AC.2	Use architecture and construction skills to create and manage a project.
9.3.12.AC.3	Comply with regulations and applicable codes to establish and manage a legal and safe workplace.
9.3.12.AC.4	Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.
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9.3.12.AC-CST.9	Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
9.3.12.AC-MO.2	Use troubleshooting procedures when solving a maintenance problem in buildings.

Target 1

SWBAT identify plumbing components and how water is delivered to a residential home.

Target 2

SWBAT identify more advance plumbing components and how waste water is removed from a residential home.

Target 3

SWBAT solder or glue plumbing pipes together to make repairs.

Summative Assessment

Students will take on line tests through Google Classroom on Electrical Systems and Components.

Students will take on line tests through Google Classroom on Plumbing Systems and Components.

21st Century Life and Careers

Select all applicable standards from the applicable standards

CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.4	Analyze how economic conditions and societal changes influence employment trends and future education.
CAEP.9.2.12.C.6	Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.

CAEP.9.2.12.C.7	Examine the professional, legal, and ethical responsibilities for both employers and employees in the global workplace.
CAEP.9.2.12.C.8	Assess the impact of litigation and court decisions on employment laws and practices.
CAEP.9.2.12.C.9	Analyze the correlation between personal and financial behavior and employability.

Formative Assessment and Performance Opportunities

Student will be graded by observation of performance and functionality of small group projects on Electical Circuit.

Student will be graded by observation of performance and functionality of small group projects on Plumbing repair of Pipe.

Accommodations/Modifications

Students with Accommodations/Modifications can be assisted by students that have already completed the task.

Students with Accommodations/Modifications can retake the topic tests or take the test with a Special Needs Teacher.

Unit Resources

You tube videos on Topics.

Interdisciplinary Connections

MA.K-12.1	Make sense of problems and persevere in solving them.
SCI.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
SCI.HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
SCI.HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

SCI.HS-ETS1	Engineering Design
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
	Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.