SPRING GROVE AREA SCHOOL DISTRICT

PLANNED COURSE OVERVIEW

Course Title: Home Maintenance	**Length of Course:** 15 cycles
Grade Level(s): 9-12	**Periods Per Cycle:** 3
Units of Credit: .25	**Length of Period:** 43 minutes
Classification: Elective	**Total Instructional Time:** 32.25 hours

Course Description

This course is designed to be a practical course in residential construction and knowledge of woods and woodworking technologies. The students will learn about wall framing construction, residential wiring, plumbing, drywall application, finishing, and wood finishing techniques used in construction.

Instructional Strategies, Learning Practices, Activities, and Experiences

Principles of Electricity Lesson
Wire Residential Circuits
Measure and Calculate Electricity
Student Participation During Demonstrations
Home Energy Efficiency
Demonstration on How to Frame a House
How to Measure and Cut Finishing Materials
Hand and Power Tool Safety Lessons
Teacher Lecture on Machine Safety
Guest Presenters

Assessments

Student Measuring and Cutting Activities
Electricity Principles Quiz
Final Exam
Wall Framing Quiz
Grade on Daily Participation
Frame and Wiring Activity
Calculating Cost/Payback
Power Tool Safety Quiz
Cooperative Learning Projects
Summative Assessments
Insulation Quiz

Materials/Resources

Hand Tools
Power Tools
Tech Ed Resource Library
Google Classroom

Adopted: 8/18/08
Revised: 5/21/18; 12/9/20

Residential Framing	
KEY CONCEPTS	**OBJECTIVES/STANDARDS**
A. Safely using manufacturing machinery to conduct a wall framing activity B. Measuring to a tolerance of +-1/16” C. Converting fractions to decimal forms D. Using manufacturing equipment to machine materials to a tolerance of +-1/16” E. Using hand and power tools to fasten materials F. Identifying wood fasteners and explaining the appropriate applications G. Identify parts associated with wall framing H. Apply Pythagorean Theorem <u>Related Vocabulary:</u> stud sole plate trimmer stud cripple stud rough sill double top plate pythagorean theorem inside corner	**Science and Technology Standards** **3.4.10.A2** ~ Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems. **3.4.10.C1** ~ Apply the components of the technological design process. **3.4.10.C2** ~ Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments. **3.4.10.C3** ~ Illustrate the concept that not all problems are technological and not every problem can be solved using technology. **3.4.10.D2** ~ Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it. **3.4.12.E7** ~ Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world. **3.4.10.E7.** ~ Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency. **Mathematics Standards** **CC.2.1.HS.F.4** ~ Use units as a way to understand problems and to guide the solution of multi-step problems. **CC.2.3.HS.A.13** ~ Analyze relationships between two-dimensional and three-dimensional objects. **CC.2.1.HS.F.2** ~ Apply properties of rational and irrational numbers to solve real-world or mathematical problems. **CC.2.1.HS.F.3** ~ Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays. **CC.2.3.HS.A.6** ~ Verify and apply theorems involving similarity as they relate to plane figures. **CC.2.2.HS.C.9** ~ Prove the Pythagorean identity and use it to calculate trigonometric ratios. **English Language Arts Standards** **CC.1.3.9-10.J** ~ Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Introduction to Residential Wiring	
Content/Key Concepts	**OBJECTIVES/STANDARDS**
A. Voltage, current, and power B. Solving for voltage, current, and watts C. Solving for kilowatt hours D. Measuring volts, amps, and watts E. Watt's Theory of Power F. Parts of a circuit G. Hand tools used in residential wiring H. Determining the proper gauge wire for specified circuits I. Defining ampacity J. Safety rules <u>Related Vocabulary:</u> voltage current power kilowatt hours control device load conductor/path source ampacity	**Science and Technology Standards** **3.4.10.C1** ~ Apply the components of the technological design process. **3.4.10.C2** ~ Analyze a prototype and/or create a working model to test a design concept by making actual observations and necessary adjustments. **3.4.10.C3** ~ Illustrate the concept that not all problems are technological and not every problem can be solved using technology. **3.4.10.D2** ~ Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it. **3.4.10.E3** ~ Compare and contrast the major forms of energy: thermal, radiant, electrical, mechanical, chemical, nuclear and others. **Mathematics Standards** **CC.2.1.HS.F.2** ~ Apply properties of rational and irrational numbers to solve real-world or mathematical problems. **CC.2.1.HS.F.4** ~ Use units as a way to understand problems and to guide the solution of multi-step problems. **CC.2.2.HS.D.8** ~ Apply inverse operations to solve equations or formulas for a given variable. **CC.2.2.HS.D.10** ~ Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically. **English Language Arts Standards** **CC.1.3.9-10.J** ~ Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Introduction to Thermal Insulation	
Content/Key Concepts	**OBJECTIVES/STANDARDS**
A. Explaining the purpose B. Three transfers of heat – conduction, convection, and radiation C. Principles of conduction D. Principles of convection E. Principles of radiation F. Types of insulation G. Where to apply insulation H. R-Values I. Water vapor and condensation J. Purpose of a vapor barrier K. How to hang insulation L. Safety rules when working with insulation <u>Relate Vocabulary:</u> conduction convection radiation R-value condensation vapor barrier	**Science and Technology Standards** **3.4.10.A2** ~ Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems. **3.4.10.C3** ~ Illustrate the concept that not all problems are technological and not every problem can be solved using technology. **3.4.10.E3** ~ Compare and contrast the major forms of energy: thermal, radiant, electrical, mechanical, chemical, nuclear and others. **Mathematics Standards** **CC.2.1.HS.F.2** ~ Apply properties of rational and irrational numbers to solve real-world or mathematical problems. **English Language Arts Standards** **CC.1.3.9-10.J** ~ Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Interior Wall Finishing	
Content/Key Concepts	**OBJECTIVES/STANDARDS**
A. Gypsum wallboard B. Sizes of gypsum C. Single layer D. Hanging methods parallel/perpendicular E. Hand and power tools safety and use F. Spacing of fasteners G. Joint and fastener concealment H. Gypsum repair I. Concealment of corners <u>Related Vocabulary:</u> single/double layer parallel/perpendicular concealment	**Science and Technology Standards** **3.4.10.A2.** ~ Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems. **3.4.10.B1.** ~ Compare and contrast how the use of technology involves weighing the trade-offs between the positive and negative effects. **3.4.10.B4.** ~ Recognize that technological development has been evolutionary, the result of a series of refinements to a basic invention. **3.4.10.C3.** ~ Illustrate the concept that not all problems are technological and not every problem can be solved using technology. **Mathematics Standards** **2.1.HS.F.4** ~ Use units as a way to understand problems and to guide the solution of multi-step problems. **English Language Arts Standards** **CC.1.3.9-10.J** ~ Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.