

## Wilson Area School District Planned Course Guide

**Title of planned course:** Home Repair and Maintenance

**Subject Area:** Technology Education

**Grade Level:** 9-12

**Course Description:** This hands-on class is designed to give students a working knowledge of how to make household repairs through the introduction of hand and power tools and techniques needed for basic home maintenance. The fundamentals of electricity, carpentry, masonry and appliance trouble-shooting and repairs will be explored. Also, students will review fundamental methods in repairing common household items such as electrical outlets, drywall, and even framing. The understanding of blueprints and its importance relating to trouble-shooting problems buried within a wall structure will also be covered.

**Time/Credit for this Course:** Half Year / 0.5 credit

**Curriculum Writing Committee:** Erik Everett

**Wilson Area School District  
Planned Course Materials**

**Course Title:** Home Repair and Maintenance

**Textbook:** Home Repair and Maintenance  
Goodheart – Willcox Publisher  
1996

**Teacher Resources:** (STEELS Standards) [pdesas.org](http://pdesas.org)

## Curriculum Map

### Fall Semester

**August:** Introduction to home repair topics

**September:** Introduction to home repair topics  
Lumber and Building Materials

**October:** Structural Parts of the House  
Electrical Distribution System

**November:** Electrical Distribution System  
Insulation, drywall, & Paint

**December:** Doors & Windows  
Potable Water Systems

**January:** Waste Disposal Systems

### Spring Semester

**January:** Introduction to home repair topics

**February:** Introduction to home repair topics  
Lumber and Building Materials

**March:** Structural Parts of the House  
Electrical Distribution System

**April:** Electrical Distribution System  
Insulation, drywall, & Paint

**May:** Doors & Windows  
Potable Water Systems

**June:** Waste Disposal Systems

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Introduction to Home Repair Topics

**Time frame:** 4 weeks

**STEELS Standards:**

3.5.9-12.A - Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.B - Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.

3.5.9-12. D - Critique whether existing or proposed technologies use resources sustainably.

3.5.9-12.F Evaluate a technological innovation that arose from a specific society's unique need or want.

3.5.9-12.I (ETS) - 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.

3.5.9-12.Y (ETS)- Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

3.5.9-12.BB - Assess how similarities and differences among scientific, technological, engineering, and mathematical knowledge and skills contributed to the design of a product or system.

3.5.9-12.DD - Develop a plan that incorporates knowledge from science, mathematics, and other disciplines to design or improve a technological product or system.

**Essential content/objectives:** At end of the unit, students will be able to:

- Understand the course expectations and timeline for instruction.
- Understand the discipline policy that relates to behavior in this class.
- Utilize the Customary system of measurement and present measurements in simplest form.
- Add, Subtract, and divide fractions and present them in simplest form.
- Model and compare values of integers, mixed numbers, fractions, and decimals.
- Identify the steps take after a home-related accident
- Demonstrate effective practice of eliminating hazards, poor decisions, and unsafe conditions that could lead to accidents.
- Evaluate which tools and machines can be used to achieve good results with minimal waste.
- List some safety aids everyone should have in their home
- Recognize tools used for measuring, fastening, cutting, drilling and other jobs
- Identify and categorize various hand tools, power tools, and machines used in home repair.
- Explain the functions and proper use of common tools in home-related tasks.
- Demonstrate proper handling, maintenance, and storage of tools.

- Understand and apply essential safety precautions when using home repair tools and machines.
- Recognize and use personal protective equipment (PPE) to prevent accidents.

**Core Activities:** Students will complete/participate in the following:

- **Course introduction presentation & handouts**
  - Course description
  - Class expectations
  - Grading procedures
  - Assignment posting & completion
  - Classroom tour
  - Student storage
  - Bathroom procedure
- **Introduction to safety, tools, & machines**
  - Begin with a question: “What tools have you used at home for repairs? How did you ensure safety?”
  - Explain the importance of knowing the right tools and practicing safety to prevent accidents and ensure efficiency.
  - Discuss the importance of evaluating tools and methods in home repair, considering various constraints and impacts
  - A brief overview of three main categories:
    - Hand Tools – basic tools for manual work
    - Power Tools – tools that run on electricity or battery for efficiency
    - Machines – larger, stationary or semi-portable equipment used for major tasks
  - Application: Students assess various tools and methods for home repair tasks, considering factors such as safety, efficiency, cost, and environmental impact.
- **Hand Tools (Show and Explain)**
  - Measuring & Marking Tools – Tape measure, level, chalk line, square,
  - Cutting Tools – Utility knife, hacksaw
  - Fastening Tools – Hammer, screwdrivers, wrenches
  - Gripping & Holding Tools – Pliers, clamps
  - Shaping Tools – Chisels, rasp
- **Power Tools (Demonstrate Use)**
  - Drills & Drivers – Cordless drill, impact driver
  - Saws – Circular saw, jigsaw, reciprocating saw
  - Grinding & Sanding Tools – Angle grinder, orbital sander
  - Fastening tools – Nail gun
  - Application: Students develop a step-by-step plan for a home repair project, selecting appropriate tools and safety measures for each task.
- **Machines (Discuss & Demonstrate Safe Use)**
  - Table saw & miter saw – for precise cutting
  - Air compressor – for pneumatic tools
- **General Safety Rules:**
  - Always wear appropriate PPE (gloves, goggles, masks, ear protection).
  - Keep tools and machines clean and in working order.
  - Use the right tool for the right job.
  - Keep work areas organized and free from hazards.
  - Know where the emergency shut-off switches are.
  - Application: Students explore the environmental and societal impacts of tool and material selection in home repairs, promoting safe and sustainable practices.
- **Safe Handling & Maintenance:**

- Proper storage of tools to avoid damage.
- Inspect tools for defects before use.
- Correct posture and grip when using power tools.
- **Emergency Procedures:**
  - How to handle injuries and accidents.
  - Fire extinguisher locations and use.
  - First aid basics for cuts, burns, and electric shocks.
- **Basic measurements worksheet and layout techniques demonstration**
  - Customary System
    - 1/16 Precision
    - Adding, subtracting, dividing fractions
  - Unit conversions
    - inches to mm
  - Ruler, tape measure, & square use

### **Extensions:**

- Complete a safety evaluation of tools at home
- Tool identification scavenger hunt: Students will explore different tools and their functions.
- Current events
- Material measurement challenge
- Create a safety poster for a specific tool to be displayed in the classroom.
- Research and write a one-page report on a power tool or machine, including its history, uses, and safety precautions.

### **Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching
- Supplemental reading

### **Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs
- Lecture
- Observation
- Peer-to-peer collaboration
- Group problem-solving

### **Materials & Resources:**

- Safety Equipment
- First Aid Checklist
- Google classroom assignments
  - Worksheets
  - Safety Videos
- Supplemental books
- Internet resources
- Video / Projector

- Assorted hand tools (hammers, screwdrivers, wrenches, pliers, measuring tape, utility knife, etc.)
- Power tools (drill, circular saw, jigsaw, angle grinder, etc.)
- Machines (air compressor, table saw, miter saw, etc.)
- Safety equipment (goggles, gloves, ear protection, dust mask, hard hat, first aid kit)
- Printed safety guidelines and tool manuals

**Assessments:**

- Machine/tool safety tests
- Measurement test
- Class discussion (Question & Answer)
- Homework/classwork assignments

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Lumber and Building Materials

**Time frame:** 1-2 weeks

**STEELS Standards:**

3.5.9-12.A - Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.B - Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.

3.5.9-12. D - Critique whether existing or proposed technologies use resources sustainably.

3.5.9-12.F - Evaluate a technological innovation that arose from a specific society's unique need or want.

3.5.9-12.I (ETS) - 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.

3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

**Essential content/objectives:** At end of the unit, students will be able to:

- List actual sizes for the most common lumber
- Understand how to choose materials for different projects.
- Evaluate the properties of various building materials and how they impact construction decisions.
- Explore sustainable practices in the use of lumber and building materials in construction.
- Identify and categorize common building materials (e.g., wood, concrete, steel, glass, etc.) based on their properties and uses.
- Describe the properties of each material (e.g., strength, durability, flexibility, insulation).
- Explain the advantages and disadvantages of different building materials in various construction projects.
- Understand the environmental impact of building materials, including sustainability and resource use.
- Apply knowledge of building materials to choose appropriate materials for specific types of construction (residential, commercial, infrastructure)
- Identify different types of lumber and common building materials.
- Understand the characteristics, strengths, and applications of various wood types.
- Interpret lumber grading and sizing standards.
- Recognize the differences between engineered and natural wood products.
- Select appropriate materials for common home repair and construction projects.

**Core Activities:** Students will complete/participate in the following:

- **Introduction to Lumber and Building Materials**
  - Discuss the importance of choosing the right material for home repair and construction.
  - Overview of natural vs. engineered wood products.
  - Quick brainstorming: Ask students what materials they have seen used in home construction or repairs.
- **Types of Lumber and Their Applications**
  - Explain the differences between hardwoods (oak, maple, cherry) and softwoods (pine, fir, cedar).
  - Discuss common uses for each type of lumber in home repair.
  - Show physical samples and allow students to examine textures and grains.
- **Lumber Grading and Sizing Standards**
  - Define key lumber terms: nominal size vs. actual size.
  - Explain grading classifications and their impact on quality and cost.
  - Demonstrate how to measure and read lumber labels.
- **Engineered Wood Products**
  - Discuss the composition and uses of plywood, MDF, OSB, and particle board.
  - Compare their benefits and drawbacks for different home repair applications.
  - Show real-life examples of where these materials are used in homes.
- **Selecting the Right Material for a Project**
  - Provide real-world repair scenarios (e.g., replacing a rotted deck board, fixing a cabinet door).
  - Have students suggest the best material for each situation and explain their reasoning.
  - Group discussion on cost, durability, and environmental impact considerations.

**Extensions:**

- Material comparison project: Students will investigate and present different types of lumber (softwood vs. hardwood).
- Class Debate: Students debate the benefits and drawbacks of using traditional vs. sustainable building materials.
- Research a home repair project and determine the best materials needed for the job.
- Write a short reflection on a past experience with lumber or building materials (e.g., helping with a home project).

**Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching
- Supplemental reading

**Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs
- Lecture
- Observation
- Peer-to-peer collaboration
- Group problem-solving

**Materials & Resources:**

- Material samples
- Google classroom assignments
  - Worksheets
- Supplemental books
- Internet resources
- Video / Projector
- Classroom tools, machines, and Materials
- Samples of various types of wood (softwood, hardwood, plywood, MDF, OSB)
- Measuring tape and calipers
- Printed charts of lumber grades and sizing standards
- Presentation with images and diagrams
- Videos demonstrating lumber processing and usage

**Assessments:**

- Weekly reflection
- Class discussion (Question & Answer)
- Homework/classwork assignments
- Project rubric

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Structural Parts of the House

**Time frame:** 2-3 weeks

### **STEELS Standards:**

3.5.9-12.A - Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.B - Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.

3.5.9-12. D - Critique whether existing or proposed technologies use resources sustainably.

3.5.9-12.I (ETS) - 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.

3.5.9-12.F Evaluate a technological innovation that arose from a specific society's unique need or want.

3.5.9-12.Y (ETS): Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

**Essential content/objectives:** At end of the unit, students will be able to:

- State the four major structures for stability, how they work, and how to construct them properly
- Define terms like stud, rafter, joist, foundation and subfloor
- Locate studs and other structure components when you need to do remodeling
- Identify and explain the key structural components of a house, including the foundation, frame, roof, walls, and floors.
- Understand the role each structural part plays in the stability and safety of a house.
- Differentiate between load-bearing and non-load-bearing components of a house.
- Analyze the materials used in constructing different parts of a house and explain why they are chosen based on their properties.
- Demonstrate the ability to label a diagram of a house's structural components.

**Core Activities:** Students will complete/participate in the following:

- **Blueprints**
  - Scaled drawing with dimensions and layouts
  - Tools: Architect scale, square, pencil
  - Application: Students will create a scaled blueprint of a wall they will frame with electrical boxes.
- **Foundation:**
  - Function: Provides stability and supports the weight of the house.
  - Materials: Concrete, cinder block, steel, stone, or wood.
  - Types: Slab, crawl space, and basement foundations.

- Application: Discuss how areas with unstable soil, a deep foundation (e.g., piles) may be needed. For example, buildings on floodplains often use reinforced concrete slabs or pilings to resist shifting.
- Application: Tour the school to view examples of foundation materials.
- **Walls:**
  - Function: Provide shelter, divide spaces, and offer structural support.
  - Types: Load-bearing vs. non-load-bearing.
  - Materials: Brick, concrete, wood, drywall (interior)
  - Components: Beams, columns, studs.
  - Application: Students will layout and cut 2x4's & plywood using numerous cutting tools for practice.
  - Application: Students will use several different fasteners to secure the studs & plywood together, creating their wall structure.
  - Application: Discuss how open-concept floor plans may require the removal or reinforcement of load-bearing walls.
- **Roof**
  - Function: Protects from the elements (rain, sun, wind).
  - Components: Rafters, trusses, shingles, etc.
  - Types: Gable, hip, flat, etc.
  - Application: Tour the school to view examples of different roof structures and waterproofing materials.
- **Floors**
  - Function: Provide the horizontal surfaces on each level.
  - Materials: Concrete, wood, steel, etc.
  - Components: Joists, beams, subflooring.
  - Application: Setup a demonstration of how a floor structure is constructed using 2 by material and plywood sheathing.

### **Extensions:**

- Repair or maintain the home in which the student lives
- Create a model of a house using cardboard, illustrating the structural parts.
- Field trip to a construction site to observe structural elements in real life.
- Ask students to research the different materials used in house construction today and write a short report on how advances in materials (like steel or concrete) have influenced modern house designs.
- Discuss how the foundations of high-rise buildings differ from those of single-family homes due to weight distribution and soil conditions.
- Look at a specific case study where modern wood framing (e.g., platform framing) was used in a residential home versus steel framing in skyscrapers.

### **Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching
- Supplemental reading

### **Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs

- Lecture
- Observation
- Peer-to-peer collaboration
- Group problem-solving

**Materials & Resources:**

- Material samples
- Google classroom assignments
  - Worksheets
- Supplemental books
- Internet resources
- Video / Projector
- Classroom tools, machines, and Materials
- Drawings
- Blueprints
- Graph Paper
- Construction Tools
- 2x4's
- Plywood
- Nails, screws

**Assessments:**

- Weekly reflection
- Class discussion (Question & Answer)
- Homework/classwork assignments
- Project rubric
- Skill Checklist

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Electrical Distribution System

**Time frame:** 3-4 weeks

**STEELS Standards:**

3.5.9-12.A - Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.B - Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.

3.5.9-12. D - Critique whether existing or proposed technologies use resources sustainably.

3.5.9-12.F Evaluate a technological innovation that arose from a specific society's unique need or want.

3.5.9-12.I (ETS) - 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.

3.5.9-12.Y (ETS): Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

**Essential content/objectives:** At end of the unit, students will be able to:

- Choose proper wiring sizes
- Sketch common circuits and duplex outlets
- Determine the safety of a circuit
- Use a digital multimeter to accurately measure circuit voltage
- Attach wires to screw terminals properly on receptacles, switches, and lights
- Demonstrate how to wire basic electrical circuits
- Understand the basics of home electrical systems.
- Identify safety precautions when working with electricity.
- Explain the function of each component in the distribution process.
- Understand how electricity flows from the main power source to various outlets in the house.
- Describe the safety features and electrical codes involved in residential wiring.
- Apply basic concepts of electrical resistance, current, and voltage in the context of household circuits.

**Core Activities:** Students will complete/participate in the following:

- **Electrical basics & safe working practices**
  - Ohm's Law in Residential Circuits: Briefly explain how Ohm's Law ( $V = IR$ ) applies to household circuits and why understanding resistance is important for ensuring appliances work correctly.
  - Current and Voltage: Discuss how voltage and current behave in household circuits.
  - Safe working habits: Discuss the dangers of electrical AC circuits and the importance of

working only on dead circuits.

- Application: Students will complete electrical basics worksheets through direct instruction and teacher resources.
- Application: Discuss safety at home and when to not attempt electrical work without a professional.
- Application: Students will complete an Ohm's law worksheet using their constructed outlet circuit and selecting a load device to test with.
- Application: With teacher supervision and safety guidelines, students will practice safe working habits during the electrical unit.
- **Household Electrical Distribution**
  - Power Source and Meter: Explain how electricity is supplied to the home from the utility company, and how the meter tracks the energy usage.
  - Main Circuit Breaker: Discuss the function of the main circuit breaker in controlling the flow of electricity to the entire home.
  - Subpanels: Describe how subpanels may be used for different sections or appliances in the home.
  - Wiring: Explain how wiring is installed and how the electrical current flows through various circuits (lighting, outlets, appliances).
  - Application: Display a diagram of a house's electrical layout (including power source, meter, circuit breakers, wiring, etc.).
- **Components of the Distribution System**
  - Circuit Breakers/Fuse Box: Describe how circuit breakers protect the circuits from overloads by cutting the power when necessary.
  - Outlets and Switches: Discuss the different types of outlets and switches in a home and their functions.
  - Grounding: Explain the purpose of grounding in household circuits for safety.
  - Application: Show an image of a fuse box and ask students to identify the different parts and their functions.
  - Application: provide demonstrations and wiring diagrams for students to wire and test lighting and receptacle circuits in your construct wall sections.
- **Electrical Safety and Code Compliance**
  - Safety Features: Discuss key safety devices such as GFCI outlets, smoke detectors, and the importance of correct grounding.
  - Electrical Codes: Introduce basic electrical codes used in residential wiring (e.g., National Electrical Code – NEC). Explain why following these codes is crucial for both safety and functionality.
  - Application: Have students brainstorm potential safety hazards in an improperly wired home.

### **Extensions:**

- Repair or maintain home in which student lives
- Assign students to research new technologies in residential electrical systems (e.g., smart home wiring, solar power integration) and present findings.
- Students can create a simple diagram of their home's electrical system (or a fictional one) and label the key components, explaining their functions.

### **Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching

- Supplemental reading

**Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs
- Lecture
- Observation
- Peer-to-peer collaboration
- Group problem-solving

**Materials & Resources:**

- Material samples
- Google classroom assignments
  - Worksheets
- Supplemental books
- Internet resources
- Video / Projector
- Classroom tools, machines, and Materials
- Wire Cutters
- Hammers
- Drills
- Drill Bits
- Utility Knife
- Wire Strippers
- Circuit diagrams of a typical home electrical distribution system
- Electrical components (e.g., fuse box, wires, light bulbs, light bases, Switches, Outlets, Wire Staples, electrical boxes) for demonstration (optional)

**Assessments:**

- Weekly reflection
- Class discussion (Question & Answer)
- Homework/classwork assignments
- Project rubric
- Skill Checklist

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Insulation, drywall & paint

**Time frame:** 3 weeks

**STEELS Standards:**

3.5.9-12.A - Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.B - Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.

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3.5.9-12.Y (ETS): Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

**Essential content/objectives:** At end of the unit, students will be able to:

- Choose rollers by thickness and type of material
- Describe how humidity levels cause paint problems
- Identify approximate R values for different types of insulation.
- Identify uninsulated areas in a house
- Identify different types of insulation materials and their uses in residential construction.
- Discuss how insulation contributes to energy efficiency, comfort, and safety in a home.
- Discuss common challenges encountered during insulation installation and how to address them.
- Identify the different types of interior wall coverings used in residential construction.
- Understand the steps involved in installing drywall, including cutting, hanging, and finishing.
- Learn about the finishing process of drywall, including taping, mudding, and sanding.
- Understand the basic tools and materials required for painting walls in a house.
- Demonstrate the correct technique for surface preparation (sanding, cleaning, priming).
- Effectively apply paint using brushes and rollers, achieving an even and smooth finish.
- Recognize safety protocols while painting, including ventilation, protective gear, and handling of paints.
- Calculate the amount of paint needed for a given space, ensuring proper coverage.

**Core Activities:** Students will complete/participate in the following:

- **Insulation:**

- Discuss different materials (fiberglass, cellulose, spray foam) and where each is best used (walls, attics, floors).
- Show samples of insulation materials.
- Demonstrate proper techniques for installing insulation (fitting batts into wall cavities, spraying foam, or filling attic spaces).
- Emphasize safety precautions, such as wearing gloves and goggles when handling fiberglass.
- Application: Students will practice installing insulation in mock walls or demo spaces.
- **Drywall**
  - Discuss the different types of drywall (standard, moisture-resistant, fire-resistant) and their uses.
  - Demonstrate how to measure, cut, and hang drywall on framing or existing studs.
  - Explain how to properly attach drywall using screws (spacing, depth, and placement).
  - Show how to handle seams, corners, and edges.
  - Explain the process of taping, mudding, and sanding drywall joints.
  - Discuss techniques for applying and smoothing joint compound (mud), using a drywall knife.
  - Application: Students will practice hanging drywall sheets, taping, and mudding seams on their wall sections
  - Application: Students will simulate accidental drywall damage and create a patch to fix the damaged section.
- **Paint**
  - Show samples of different types of paints (e.g., oil-based, water-based, latex).
  - Discuss the tools and materials that will be used for the lesson.
  - Surface Preparation: Sanding: How to smooth rough spots on walls. Cleaning: Importance of cleaning walls to remove dirt and dust. Priming: When and why to use primer before painting.
  - Painting Techniques: Use painter's tape to mask off areas not to be painted (baseboards, window trim). Load a roller with paint and roll it on a wall evenly. Use a brush for cutting in at edges or smaller areas.
  - Application: Students will practice painting sections of the wall, applying both primer (if necessary) and the finish coat.

### **Extensions:**

- Repair or maintain home in which student lives
- Invite a contractor or construction professional to speak to the class about real-world insulation and drywall installation challenges.
- Connect multiple wall sections together and finish each seam.

### **Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching
- Supplemental reading

### **Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs
- Lecture

- Observation
- Peer-to-peer collaboration
- Group problem-solving

**Materials & Resources:**

- Material samples
- Google classroom assignments
  - Worksheets
- Supplemental books
- Internet resources
- Video / Projector
- Classroom tools, machines, and Materials
- Batt Insulation
- Staple Gun
- Utility Knives
- Various types of insulation (fiberglass batt, spray foam, cellulose, etc.)
- Drywall sheets (4x8 ft panels)
- Drywall screws
- Drywall tape
- Joint compound (mud)
- Utility knives, measuring tapes, and saws
- Safety gloves and goggles
- Stud finders
- Tape measure and pencil
- Paint (primer and finish coat)
- Paintbrushes (various sizes)
- Paint rollers and trays
- Sandpaper and sanding blocks
- Painter's tape
- Drop cloths or plastic sheeting
- Paint stirring sticks
- Protective gear (gloves, masks, safety goggles)
- Cleaning supplies (water, soap, rags)

**Assessments:**

- Weekly reflection
- Class discussion (Question & Answer)
- Homework/classwork assignments
- Project rubric
- Skill Checklist

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Doors and Windows

**Time frame:** 2 weeks

**STEELS Standards:**

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3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

**Essential content/objectives:** At end of the unit, students will be able to:

- Identify hollow core and solid doors
- Decide how door hinges cause different binding problems
- Explain how to hang a new door
- Show how to install a lock mechanism
- List types of windows
- Learn about different types of doors and windows and their functions.
- Understand installation and repair techniques.
- Identify different types of doors and windows used in residential homes.
- Understand common issues with doors and windows and how to diagnose them.
- Demonstrate proper techniques for repairing or replacing doors and windows.
- Explain the importance of insulation, weatherproofing, and security considerations.

**Core Activities:** Students will complete/participate in the following:

- **Door & Window basics**
  - Discuss the purpose of doors and windows in a home (security, ventilation, aesthetics, insulation).
  - Show images or physical samples of different types (e.g., hinged, sliding, pocket doors, casement, double-hung windows).
  - Application: Have students identify the types of doors and windows they have at home.
- **Common Problems & Diagnosis**

- Warped doors, loose hinges, and misalignment.
- Drafty windows, broken glass, or stuck sashes.
- Demonstrate how to check for drafts and misalignment using tools like a level and a smoke pencil.
- Application: Check for drafts in the school building and discuss possible solutions.
- **Repair & Replacement Techniques**
  - Doors: Adjusting hinges, replacing locks, filling cracks, refinishing.
  - Windows: Resealing, replacing glass, fixing stuck frames, caulking for insulation.
  - Application: Have students practice hinge adjustment and replacing a deadbolt & knob
- **Insulation & Weatherproofing**
  - Explain the role of weatherstripping and energy efficiency.
  - Demonstrate proper caulking and foam insulation applications.
- **Safety & Security Considerations**
  - Discuss lock types and security features (deadbolts, reinforced frames).
  - Fire escape considerations for windows

### **Extensions:**

- Repair or maintain home in which student lives
- Community service opportunities with Habitat for Humanity (etc.)
- Research and write a one-page report on the cost and benefits of energy-efficient doors/windows.

### **Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching
- Supplemental reading

### **Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs
- Lecture
- Observation
- Peer-to-peer collaboration
- Group problem-solving

### **Materials & Resources:**

- Material samples
- Google classroom assignments
  - Worksheets
- Supplemental books
- Internet resources
- Video / Projector
- Classroom tools, machines, and Materials
- Locksets
- Doors
- Windows
- Framed Wall
- Nails and Screws

- Chisels and Hammers
- Circular Saw
- Square
- Screw Gun
- Putty Knife
- Utility Knife
- Jigsaw
- Pre-hung door
- Window frame and sash
- Measuring tape
- Level
- Screws and nails
- Drill
- Hammer
- Screwdriver
- Shims
- Caulk and caulking gun

**Assessments:**

- Weekly reflection
- Class discussion (Question & Answer)
- Homework/classwork assignments
- Project rubric
- Skill Checklist

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Potable Water Systems

**Time frame:** 1 week

**STEELS Standards:**

3.5.9-12.A - Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.B - Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.

3.5.9-12. D - Critique whether existing or proposed technologies use resources sustainably.

3.5.9-12.F Evaluate a technological innovation that arose from a specific society's unique need or want.

3.5.9-12.I (ETS) - 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.

3.5.9-12.Y (ETS): Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

**Essential content/objectives:** At end of the unit, students will be able to:

- Select kinds of pipe and fittings for a job
- Calculate lengths of pipe and fitting allowances
- Explain how to solder copper pipe
- Demonstrate the cause and solution to water hammer
- Describe how to join plastic pipe
- Understand the components of a potable water system.
- Learn about water filtration methods.
- Define potable water and explain its importance in home plumbing.
- Identify key components of a potable water system, including pipes, valves, and fixtures.
- Explain how water is sourced, treated, and distributed in a home.
- Demonstrate basic troubleshooting and maintenance techniques for home water systems.
- Apply safety measures when working with potable water systems.

**Core Activities:** Students will complete/participate in the following:

- **Introduction to potable water**
  - Definition: What is potable water? Difference between potable and non-potable water.
  - Importance: Why a safe water supply is essential for health and home maintenance.
  - Water Sources: Municipal vs. well water systems.
- **Components of a Home Potable Water System**
  - Pipes & Materials: Copper, PEX, PVC, and galvanized steel.

- Valves & Fixtures: Shut-off valves, faucets, water meters.
- Pressure Regulation: How pressure affects plumbing and common issues.
- Water Heater Basics: How potable water is heated and delivered.
- Application: Have students practice with making pipe connections such as soldering copper, crimping PEX, and gluing PVC
- **Water Treatment & Filtration**
  - Municipal Treatment: Filtration, disinfection (chlorination/UV).
  - Home Filtration Systems: Carbon filters, reverse osmosis, water softeners.
  - Common Water Contaminants: Lead, bacteria, sediments, hard water.
  - Application: Have a student volunteer bring in a water sample and use a test kit to check the water quality
- **Maintenance & Troubleshooting**
  - Common Issues & Fixes: Leaky faucets and pipes. Low water pressure causes. Water discoloration and odors. Preventing frozen pipes in winter.
  - Application: Students inspect and identify plumbing components in a classroom demo setup.

### **Extensions:**

- Repair or maintain home in which student lives
- Divide students into small groups and provide water samples with various contaminants.

### **Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching
- Supplemental reading

### **Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs
- Lecture
- Observation
- Peer-to-peer collaboration
- Group problem-solving

### **Materials & Resources:**

- Material samples
- Google classroom assignments
  - Worksheets
- Supplemental books
- Internet resources
- Video / Projector
- Classroom tools, machines, and Materials
- Diagrams of a home water system.
- Sample pipes and fittings (PEX, copper, PVC).
- Basic plumbing tools.

**Assessments:**

- Weekly reflection
- Class discussion (Question & Answer)
- Homework/classwork assignments
- Project rubric
- Skill Checklist

## Curriculum Scope & Sequence

**Planned Course:** Home Repair and Maintenance

**Unit:** Waste Disposal Systems

**Time frame:** 1 week

**STEELS Standards:**

3.5.9-12.A - Use various approaches to communicate processes and procedures for using, maintaining, and assessing technological products and systems.

3.5.9-12.B - Critically assess and evaluate a technology that minimizes resource use and resulting waste to achieve a goal.

3.5.9-12. D - Critique whether existing or proposed technologies use resources sustainably.

3.5.9-12.F Evaluate a technological innovation that arose from a specific society's unique need or want.

3.5.9-12.I (ETS) - 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.

3.5.9-12.Y (ETS): Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

3.5.9-12.AA - Safely apply an appropriate range of making skills to a design thinking process.

**Essential content/objectives:** At end of the unit, students will be able to:

- Define terms used for drain, waste, and vent systems
- Explain purpose and operation of traps and vents
- Specify pipe slopes needed for waste flow
- List the parts of the toilet flush system
- Solve problems with garbage disposals
- Demonstrate how to install a sink and faucet
- Learn about different waste disposal systems (septic systems, municipal).
- Understand the importance of proper waste management.
- Identify different types of waste disposal systems used in residential settings.
- Explain the function and maintenance of waste disposal systems.
- Demonstrate knowledge of environmentally responsible waste disposal methods.
- Assess common problems associated with waste disposal systems and propose solutions.

**Core Activities:** Students will complete/participate in the following:

- **Types of Waste Disposal Systems**
  - Sewer System: Explanation of municipal waste removal and treatment.
  - Septic Systems: How they function, maintenance requirements, and signs of failure.
  - Garbage Disposals: Safe use and common issues.
  - Composting Systems: Benefits of organic waste management
- **Drain system components**
  - P-trap: Prevents sewer gases from entering the home.

- Drain pipe: Channels wastewater to the main plumbing system.
- Vent pipe: Allows air to flow and prevents siphoning.
- Cleanout: Provides access for clearing blockages.
- Application: Have students practice removing a sink trap, cleaning it, and reinstalling
- **Maintenance and Troubleshooting**
  - Discuss routine maintenance for each type of waste disposal system.
  - Common problems (e.g., clogs, leaks, foul odors) and how to address them.
  - Proper waste disposal practices to prevent damage (e.g., avoiding grease in drains).

### **Extensions:**

- Repair or maintain home in which student lives
- Create a flow chart illustrating the waste disposal process in your home.
- Visit a local waste treatment facility to learn about waste processing.
- Research and report on an innovative or eco-friendly waste disposal method.

### **Remediation:**

- Review
- Unit Terms and Questions
- Homework
- One-on-one re-teaching
- Supplemental reading

### **Instructional Methods:**

- Direct instruction
- Demonstrations
- Labs
- Lecture
- Observation
- Peer-to-peer collaboration
- Group problem-solving

### **Materials & Resources:**

- Material samples
- Google classroom assignments
  - Worksheets
- Supplemental books
- Internet resources
- Video / Projector
- Classroom tools, machines, and Materials
- Diagrams of waste disposal systems (septic tanks, sewer systems, garbage disposals, composting systems)
- Sample plumbing components (PVC pipes, filters, drain traps)

### **Assessments:**

- Weekly reflection
- Class discussion (Question & Answer)
- Homework/classwork assignments
- Project rubric
- Skill Checklist