Construction Framing

Construction Framing is a one-credit course designed to provide students with an understanding of the framing phase of a structure, including framing components. Topics include career opportunities, safety, lumber, material estimation, floor systems, wall framing, ceiling framing, stair construction, roof framing, and roof materials in various structures.

Content standards for this course are not intended to serve as the entire curriculum. Teachers are encouraged to expand the curriculum beyond the limits of these content standards to accommodate specific community interests and utilize local resources. This course encourages critical thinking, use of the scientific method, integration of technology, development of student leadership skills, and application of knowledge and skills related to practical questions and problems. Safety concepts are integrated into instruction to the maximum extent possible.

Career and technical student organizations are integral, cocurricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Career Opportunities

Student will:

1. Compare various career opportunities associated with frame construction.
   Examples: engineer, construction foreman, carpenter

Safety

2. Demonstrate job site safety in frame construction.

Grades and Types of Lumber

3. Compare applications of hardwood and softwood lumber used in framing structures.
   - Identifying grades of lumber
     Examples: appearance grade, timber grade, dimension grade
   - Identifying defects that affect lumber grade
     Examples: knot, wane, split, check, warp

Estimating Materials

4. Calculate a bill of materials for the framing of a wood structure.
Floor Systems

5. Compare advantages of concrete flooring systems and wood flooring systems.

6. Design a floor framing system for a structure.
   - Describing the purpose of a sill used in structures
   - Demonstrating the layout of joist headers and floor joists used in structures
   - Contrasting various subfloor materials used in structures
     Examples: tongue and groove plywood, plywood, oriented strand board, shiplap boards
   - Demonstrating the installation of a subfloor for a structure

Wall Framing

7. Design a wall framing system for a structure.
   - Comparing the use of wood and metal wall framing components
   - Describing the use of a soleplate in structures
   - Demonstrating the construction of corner posts with and without blocking
   - Demonstrating the use and installation of full, cripple, and trimmer studs
   - Demonstrating the installation of a double top plate in structures
   - Demonstrating the installation of rough openings for doors and windows, including headers
   - Demonstrating techniques for bracing a wall

8. Compare various wall sheathing materials for structures.
   Examples: foam board, oriented strand board, insulating board, plywood

9. Explain the importance of vapor barriers used in wall framing.
   - Comparing advantages of using plastic and building felt as vapor barriers in walls

Ceiling Framing

10. Design a ceiling framing system for a structure.
    - Demonstrating the installation of ceiling joists
    - Explaining the use of headers in two-story structures
    - Demonstrating the installation of rough openings for stairs, attic access, and chimneys

Stair Construction

11. Identify types of stairs used in structures.
    - Comparing materials used in stair construction
    - Calculating the total rise, number and size of risers, and treads for a stairway

12. Demonstrate the procedure for laying out and cutting stringers for stair construction.

13. Demonstrate the procedure for installing handrails to stairs.
Roof Framing

14. Identify types of roofs used on structures.
   Examples: hip, gable, gambrel, shed

15. Compare conventional and truss roof systems for structures.
   - Laying out common, hip, and valley rafters
   - Laying out a truss using a framing square
   - Demonstrating the installation of rough openings for vents, skylights, and chimneys

16. Compare various decking materials for roof systems.
   Examples: tongue and groove plywood, plywood, oriented strand board

Roofing Materials

17. Describe types of materials used for roof systems.
   Examples: felt, shingles, metal roofing, roll roofing

18. Demonstrate the installation of roofing materials.