



Objectives:

Students learn basic framing and practice working with architectural scale by laying out walls and trusses of a simple wood-frame building. Students work in teams to experience the making of wood framed wall and experience the structural principles of panel systems and roof truss geometries.

This activity allows students to simulate the construction of wood stud walls and roof trusses as “units” and then combine these units to form a small building. The concept of modularity in wood frame construction is introduced (16” o.c., 4’x8’, 8’x8’, etc.).

Process:

1. Introductory Power Point Presentation
 - a. Introduce concept of 16” o.c. module:
 - b. 16” x 2= 32”- window and door opening.
 - c. 16” x 3 =48” – width of plywood for sheathing
 - d. 16” x 6 = 96” – length of plywood for sheathing
2. Create teams of 10 or so students-6/7 mentors
3. Hand out **Stud Wall and Roof Truss Charts** (exterior, Interior and truss sketches with dimensions, but not-to-scale) Review 16” o.c. concept. Review 3-4-5 triangle!
4. Assign wall type panels and trusses to students. See list required below.
5. Students draw the wall stud and truss layout on graph paper at a scale of 1”=1’-0”
6. Students calculate materials required and collect from central source (all studs are pre-cut)
7. Layout Basswood sticks on wall and truss drawing.
8. Glue studs together with hot glue gun.
9. Trace constructed wall panels on paper, trim and glue on as “Sheathing” using Colored Paper. Inside walls should be covered with white paper.
10. Trace 2 constructed truss gable-end panels on same color paper as exterior.
11. Trim out doors and windows...leave one side of paper door uncut as a hinge.
12. If time allows or students are ahead, add inside layer of “white” paper, cut out openings.
13. Assemble wall segments to form a house perimeter. Add top plate to secure walls.
14. Add interior partitions if created.
15. Add roof trusses 7 trusses @ 4’ oc
16. Add paper sheathing to roof



Note: Mentors should join in the actual construction if there are insufficient students to complete the project! Mentor can assist with trimming needed studs, cutting out windows, etc.

Have extra time? Make a paper kitchen counter, etc., Chimney? Paper figure to scale?

Construction Details:

Using basswood sticks construct a 16' x 24' house to a scale of 1"=1'-0" using 8 x 8 panels and roof trusses at 4' oc. Units required for one complete 16' x 24' house:

- 10 8 x 8 Exterior Panels-one per student
 - 2 Door Panels: 8 pieces @ 8', 1 @ 32", 1 @ 16"
 - 6 Window Panels: 8 pieces @ 8', 3 @ 32", 1 @ 16"
 - 2 Solid panels: 9 pieces @ 8'
 - Total pieces for Ext: 30 pieces @ 8" = 10 lengths at 24"**

- 6 8 x 8 Interior Panels- one per student (optional)
 - 2 solid Panels- 9 pieces @ 8'
 - 4 Door Panels: 8 pieces @ 8', 1 @ 32", 1 @ 16"
 - Total Pieces for Int: 20 pieces @ 8' = 8 lengths @ 24"**

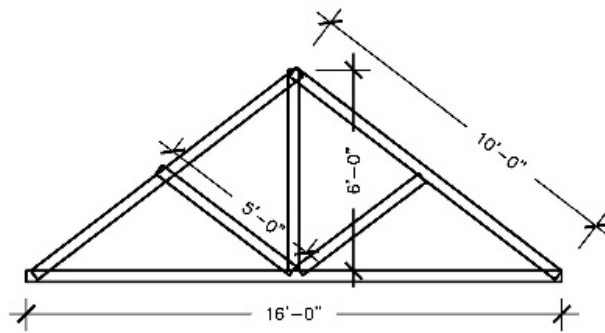
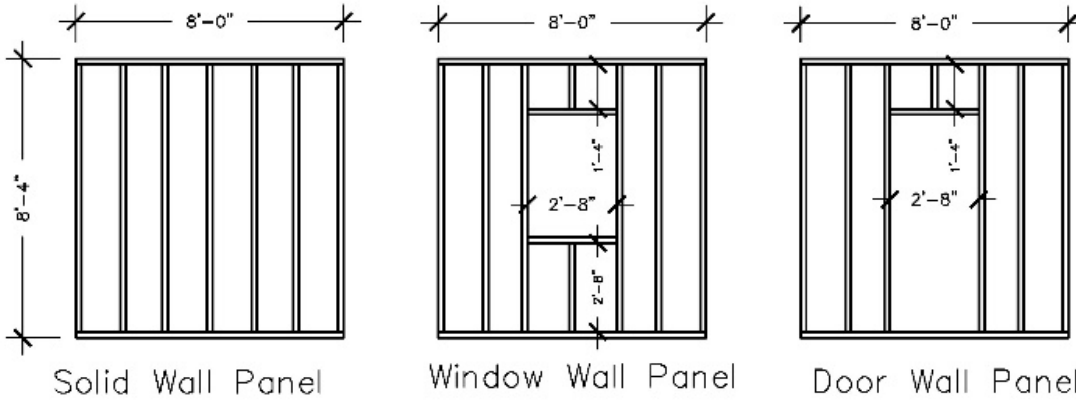
- 7 Roof Trusses-2 students
 - For each truss: 1 piece @ 16', 2 @ 10', 1 @ 6', 2 @ 5'
 - Total for 7 trusses: 7 @ 16', 14 @ 10', 7 @ 6', 14 @ 5'
 - Total Pieces for Trusses 52'x7=364' = 16 pieces @ 24"**

Tools-Equipment:

Glue Guns, Scissors, heavy weight paper for sheathing



Wall-Truss Layout



3-4-5 Triangle-Truss

