WOOD FRAMING

- The industrial Revolution of the 18th century made the wood 2x4 and mass-produced nails possible.
- In the 19th Century the 2x4 became the basis for the **Balloon Frame** method of construction.
- A refined version is the **Western Platform** frame.
- Together they account for about 80% of all the buildings in the US.... in particular, the suburban home.
2x4

- The 2x4 gets its name from its size – 2 inches by 4 inches - when it is cut from the “green” log and still has approximately 80% water content.
- However when it has been “seasoned” and the water content has been reduced to approximately 10%, its actual size shrinks to 1 ½” by 3 ½”
In mid-April, 2008, the south half of a house in Scarsdale was demolished in preparation for a new addition.
In a typical suburban residence, foundation walls of concrete block or reinforced concrete are built on a reinforced concrete footing that rests on undisturbed soil.

Where there is a basement, a 6” reinforced concrete slab is poured over a layer of gravel on the soil at the bottom of the excavation.

Wood joists rest on the top of the foundation to support the first floor.

A sub-floor of ¾” plywood is nailed to the top of the joists.

A 2x4 (or 2x6) sill plate is nailed to the floor at the perimeter of the building.

2x4 (or 2x6) vertical studs are nailed to the sill plate, 16” on center.

Foundations
Wood Studs

- Studs are vertical 2x4’s (actually 1 ½” by 3 ½”)
- Provide support for interior partitions
- May also be used to structural support for the floor above
- Usually spaced 16” on center
- May be spaced closer together for extra strength at corners and door or window openings
- In lower quality construction, may be spaced 24” o. c. for economy

**On center (o. c.)**: The spacing from the center of one object (such as a stud, a window, a tile, or a chair) to the center of the next object. Establishes the module or rhythm of a design
Batt Insulation

- **Glass fiber batts** may be placed between studs in exterior walls to provide thermal insulation and in interior partitions to provide acoustical control.
Traditional Wood Joists

- Joists provide horizontal structure. They are a type of beam used for light construction
- Traditional joists are 2x- (1 ½” by 5 ½”, 7 ¼”, 9 ¼”, 11 ¼”, etc.), typically spaced 16” o.c.
- Depth of joist is determined by the architect or structural engineer based on the span from wall to wall
- Bridging (a short piece of wood) is typically installed between joist for stability.
Rafters

- Slanted joists called rafters are used to support pitched roofs
Traditional and Modern Joists

- Traditionally joists are made of 2x- solid lumber, usually pine or fir.
- Modern joists are often made of Engineered Wood, wood that has been ground into shavings and then glued together in a mold.
Top Plate

- A 2x4 top plate is attached to the underside of the joists to anchor the partition studs
- Modern joists are often made of engineered wood—— wood that has been ground into shavings and glued together in a mold
- Blocking is a miscellaneous piece of wood placed by the contractor within a partition or ceiling cavity to provide extra support where needed
Door and Window Sub-Frames

- At doors and windows studs are doubled up for extra strength.
- The extra stud is referred to as the sub-frame and acts as anchorage for the finished door or window frame to be installed later.
- The 2x4’s above the door or window are called headers and the short studs above the headers are called cripples.
Alternate Headers

- Sometimes larger 2x members are used as headers and cripples are unnecessary.