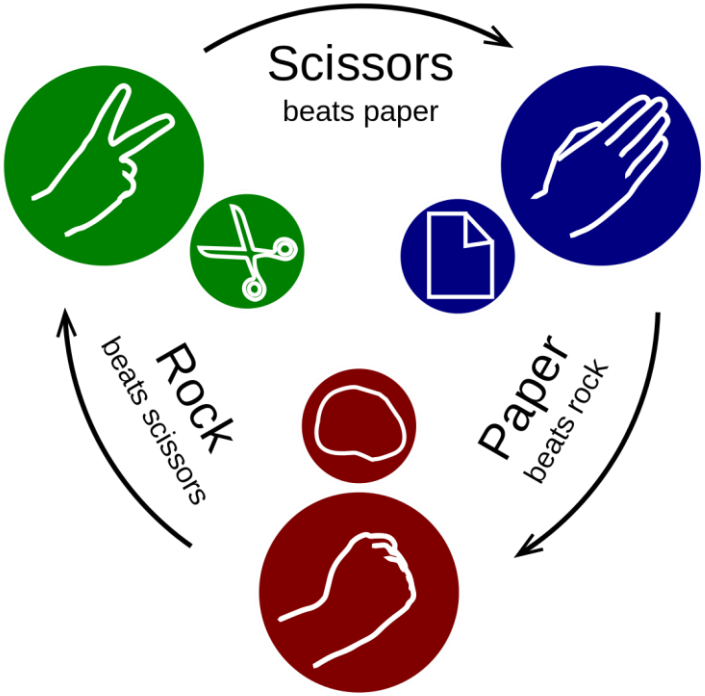
BYF
CONSTRUCTION CLUB

Session 5

Greeting



Hammer, Blueprint, Architect

Hammer=Rock
Blueprint=Paper
Architect=Scissors

Today's project: Picnic table

You will work together to make a picnic table. Then, you will sand, paint, and seal it!

Objectives

01

Project Planning

Visualize the project and how pieces fit together before starting

02

Collaboration

Working together to accomplish a common goal

03

Identify materials

Differentiating kinds of bolts and screws—carriage bolts vs. regular screws

04

Vocabulary

Countersink-Making a screw flush so there is no bump

Pocket hole-verticle hole that allows you to drill into vertical wood

Types of fasteners

Fastener Basics

Common Fastener Types

Hex bolts, or *hex cap screws*, are used in machinery and construction. Can be used with a nut, or in a tapped hole. Fully threaded hex bolts are also known as *tap bolts*.

Wood screws have large threads and a smooth shank for pulling two pieces of material together. They can be used in wood and other soft materials.

Sheet metal screws have sharp points and threads, and are designed to be driven directly into sheet metal. They can also be used in softer materials like plastic, fiberglass, or wood.

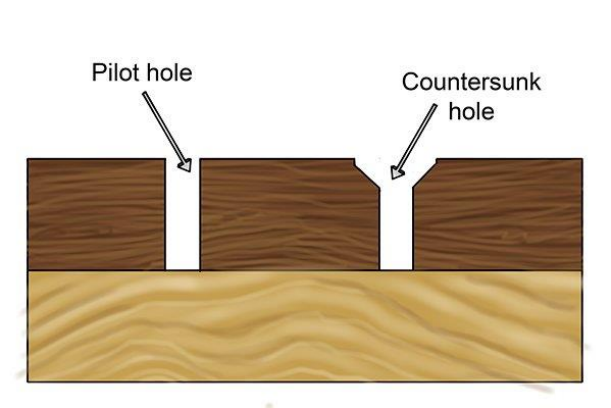
Machine screws are fully treaded for use with a nut or in a tapped hole. Certain types are sometimes referred to as *stove bolts*.

Socket screws are machine screws with an internal hex socket (*Allen*) drive. Longer lengths may have a smooth shank.

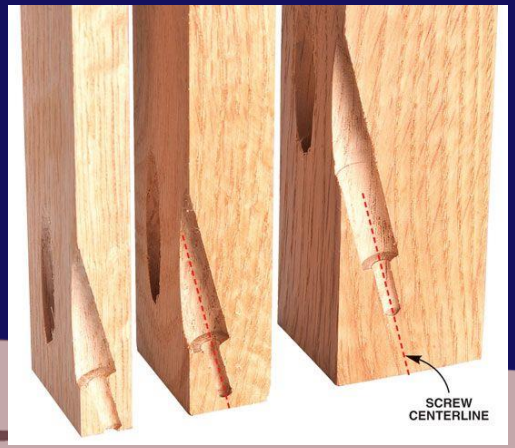
Lag bolts, or *lag screws*, are large wood screws with hex heads. Typically used for wood construction and landscaping.

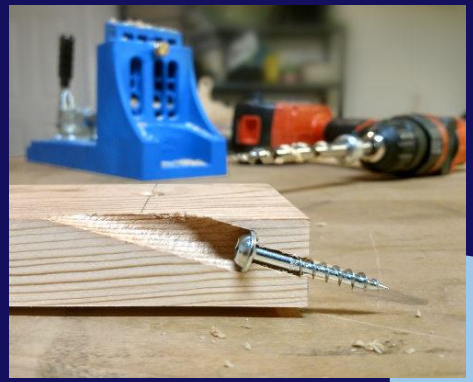
Carriage bolts have smooth, domed heads with a square section underneath that pulls into the material to prevent spinning during installation.

Vocabulary: Countersink



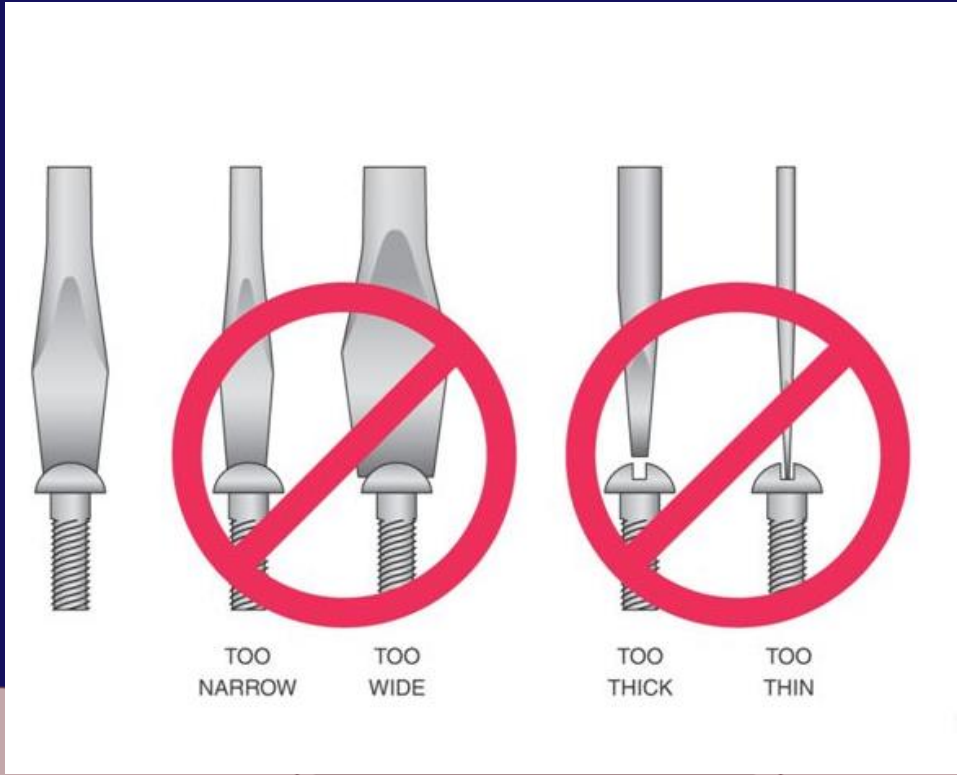
Vocabulary: Pocket hole



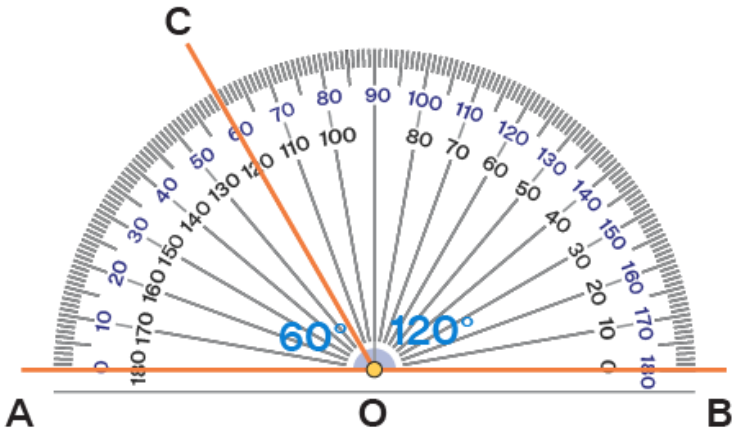


Tools: Screwdriver

Proper use of a screwdriver

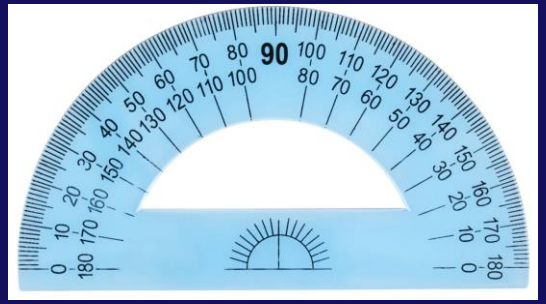


Tools: Protractor



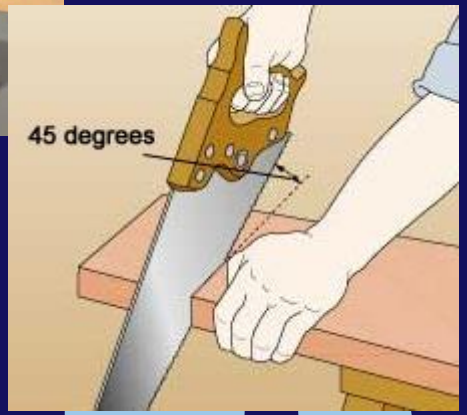
$\angle AOC = 60°$

$\angle BOC = 120°$



https://www.youtube.com/watch?v=LPc0imoebzI&t=65s

Tools: Saw



Materials Needed

- Safety glasses
- Drill
- Tape measure
- Screwdriver
- Protractor
- Saw
- Sandpaper
- Access to technology

But first, SAFETY

- Safety glasses on when “on-site”
- Be responsible for your own part
- Watch your fingers!
- Clean up after yourself
- **ONLY** high schooler or adult using power tools
- Share respectfully

Building Plans

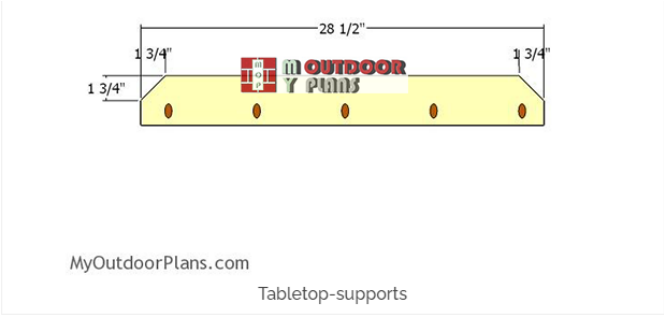
Example:

Link:

https://myoutdoorplans.com/furniture/6-foot-picnic-table-plans/

Process

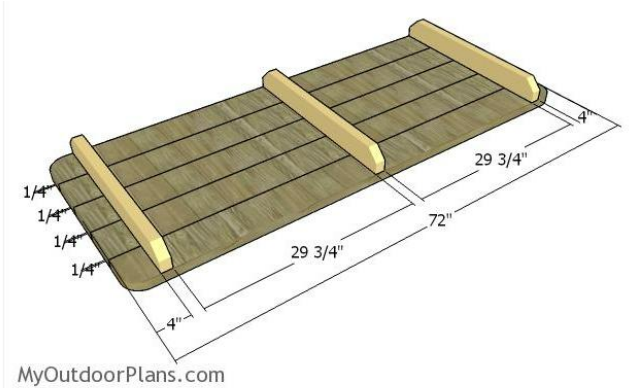
First



Tabletop-supports

Next, you need to build the tabletop supports from 2×4 lumber. Make 45 degree cuts to both ends of the supports, following the diagram. Moreover, drill pocket holes into the 2×4 supports, so you can lock it to the tabletop slats.

Next

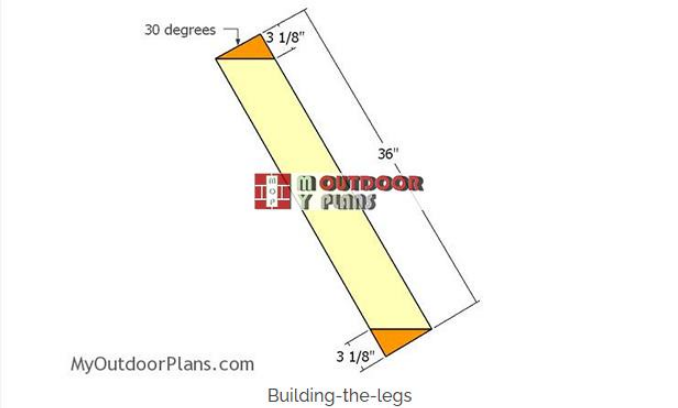


Assembling the tabletop

Lay the 2×6 tabletop slats on a level surface. Place 1/4'' plywood pieces between the slats so you can create even gaps. Fit the supports to the slats and then place them equally spaced. Insert 2 1/2'' screws to secure the supports into place tightly.

Process

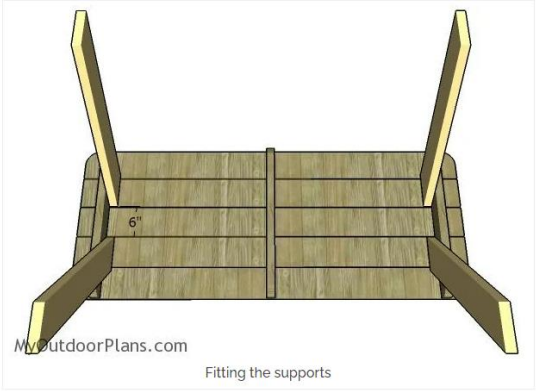
Next



Building-the-legs

The first step of the outdoor project is to build the legs for the 6' picnic table. As you can easily see in the diagram, you need to make 30 degree cuts to both ends of the 2×6 legs. Smooth the edges with sandpaper.

Then



Fitting the supports

Fit the 2×6 legs to the picnic table, as shown in the diagram. Clamp the legs to the supports and then drill pilot holes through both components. Insert 3 1/2'' carriage bolts and tighten the components into place. Use two bolts for each joint for a professional result. Using the carriage bolts will also make disassembling the picnic table easy, if you want to move it to another location.

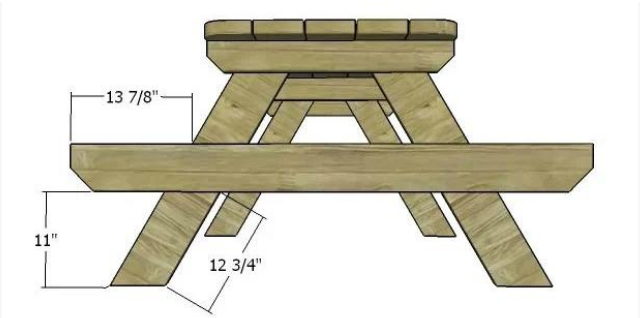
Process

Next

Seat-supports

Build the seat supports from 2×6 lumber. Make 45 degree cuts to both ends of the supports, as shown in the plans.

Then

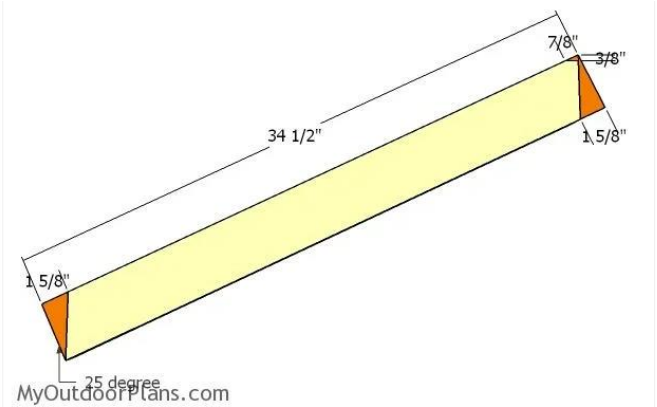


Fitting the seat supports

Align the seat supports to the legs and then clamp them into place tightly. Drill two pilot holes through the braces and through the legs, for each joint. Insert 3 1/2'' carriage bolts to lock the components together tightly. Use a spirit level to plumb the seat supports horizontally.

Process

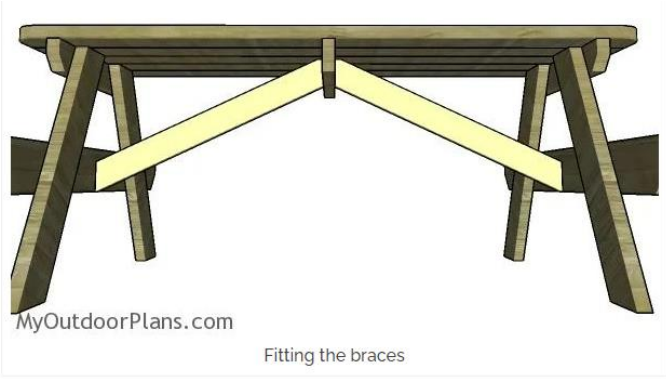
Next



Building the diagonal braces

Build the braces for the table from 2×4 lumber. Make 25 degree cuts to both ends of the diagonal braces and then get the job done with another small cut to the top end.

Then

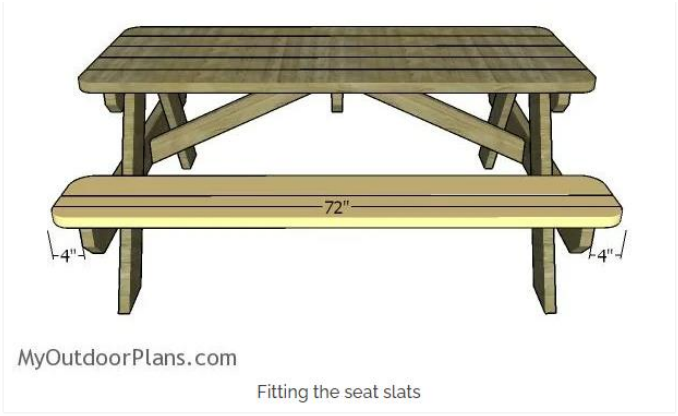


Fitting the braces

Fit the diagonal braces to the picnic table, making sure the corners are square. Use a spirit level to plumb the legs and to check if the top is horizontal. Drill pilot holes and insert 2 1/2" screws to lock the braces to the frame of the picnic table.

Process

Next



Fitting the seat slats

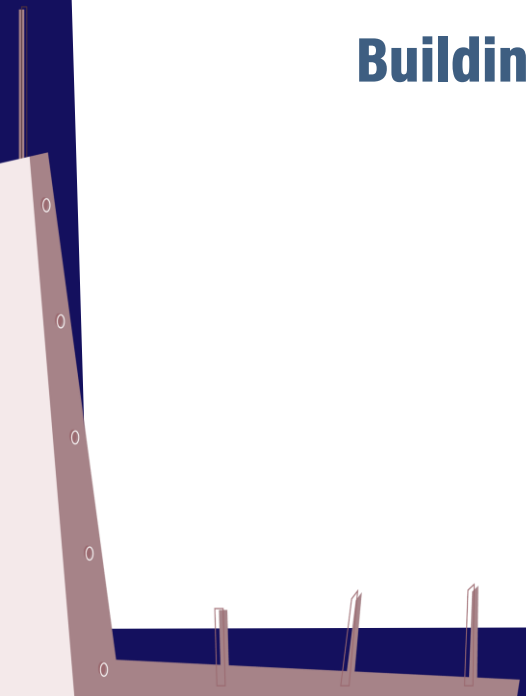
Last but not least, you need fit the 2×6 seat slats. Center the slats to the frame of the picnic table, drill pilot holes and insert 2 1/2'' screws. Countersink the head of the screws for a neat result.

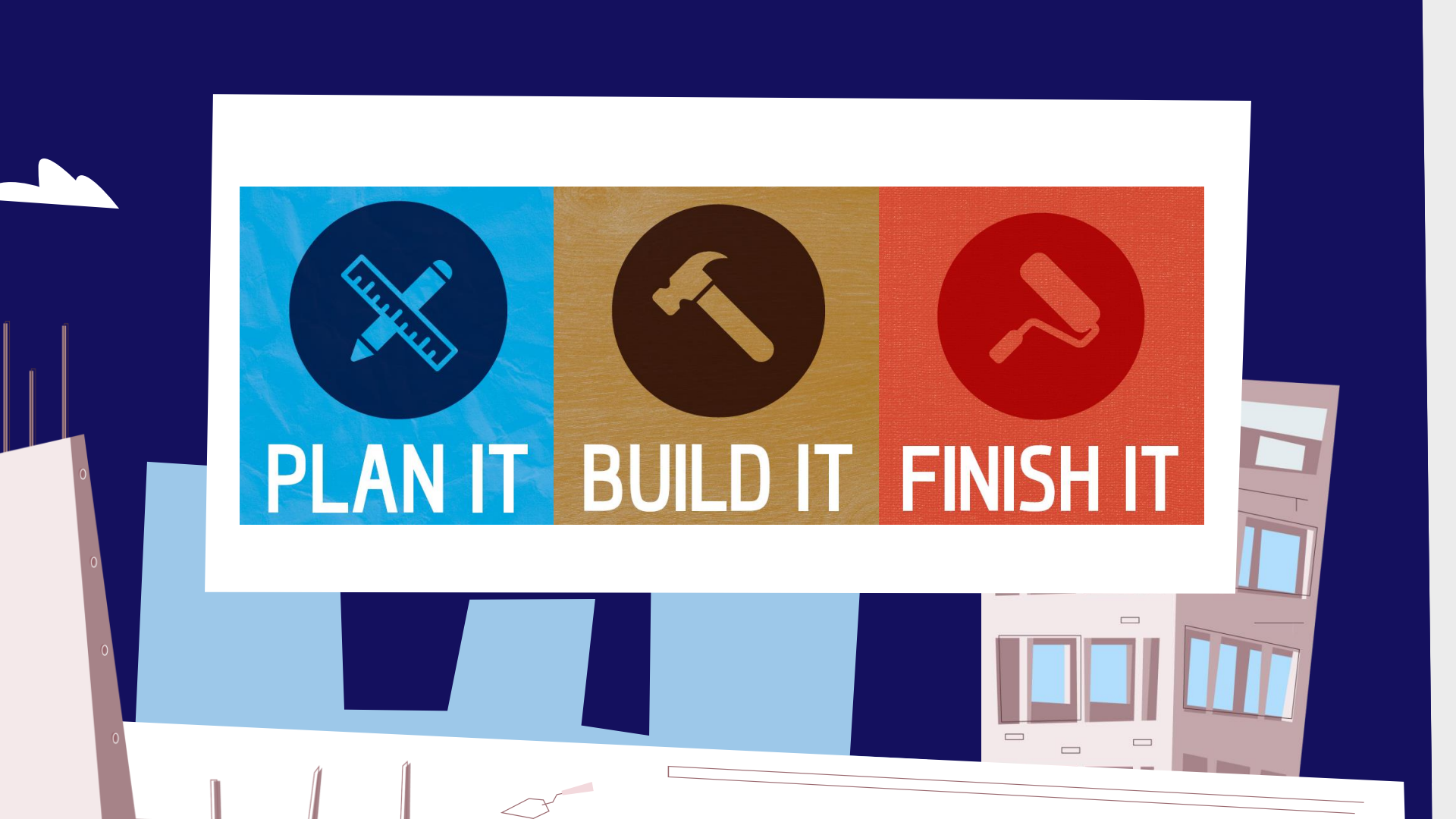
Last

JOB EXPLORATION

Residential Construction Careers

Building houses, or residences, where people live




PLAN IT
BUILD IT
FINISH IT

Plan It:
Real Estate Developer

Average Salary: $35,000 to $60,000 to $160,000+

Description: Identify housing and commercial development needs. Locate land while understanding zoning and financial processes involved with developing. Work closely with engineers, contractors, land-owners, and government employees

Education Options: Bachelor's degree +experience

Qualifications: Research, persuasive, creative, problem solver, good under pressure

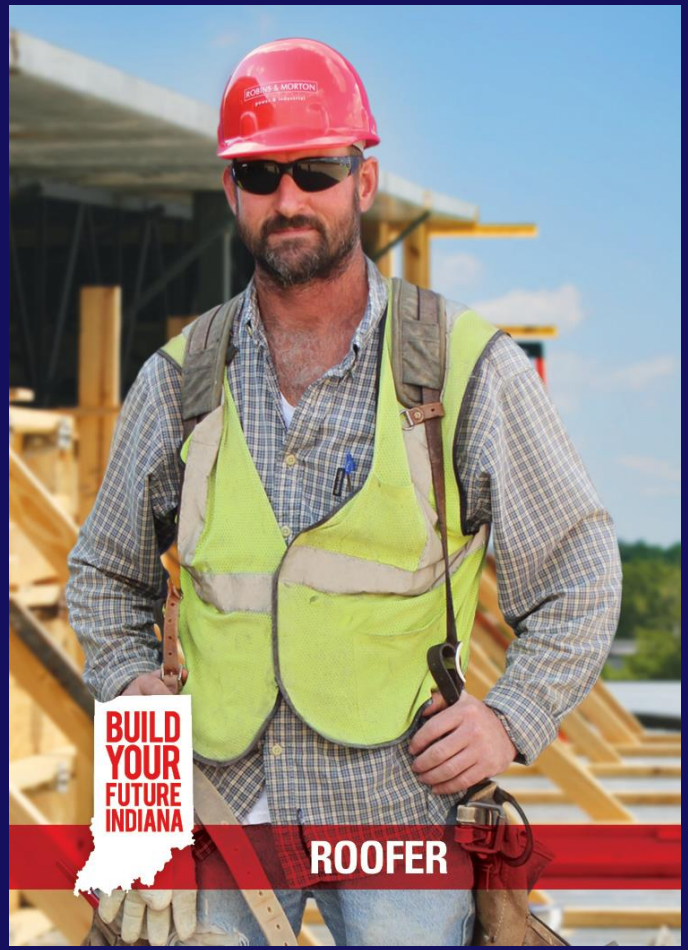
Build It: Carpenter

Average Salary: $56,877

Description: Measure, cut, and shape wood, plastic, fiberglass, and drywall; construct, install, and repair structures and fixtures

Education Options: Technical School, Community College, Registered Apprenticeship Program, and Industry Training Program

Qualifications: Coordination, manual dexterity, physical fitness, balance, ability to solve math problems quickly and accurately



Build It: Roofer

Average Salary: $42,780

Description: Use materials like shingles, asphalt, wood, and aluminum to build roofs that cover structures such as houses, malls, and hospitals

Education Options: Technical School, Community College, Registered Apprenticeship Program, and Industry Training Program

Qualifications: Coordination, balance

Finish It: Electrician

Average Salary: $67,269

Description: Install and maintain electrical and power systems for homes, business, and factories

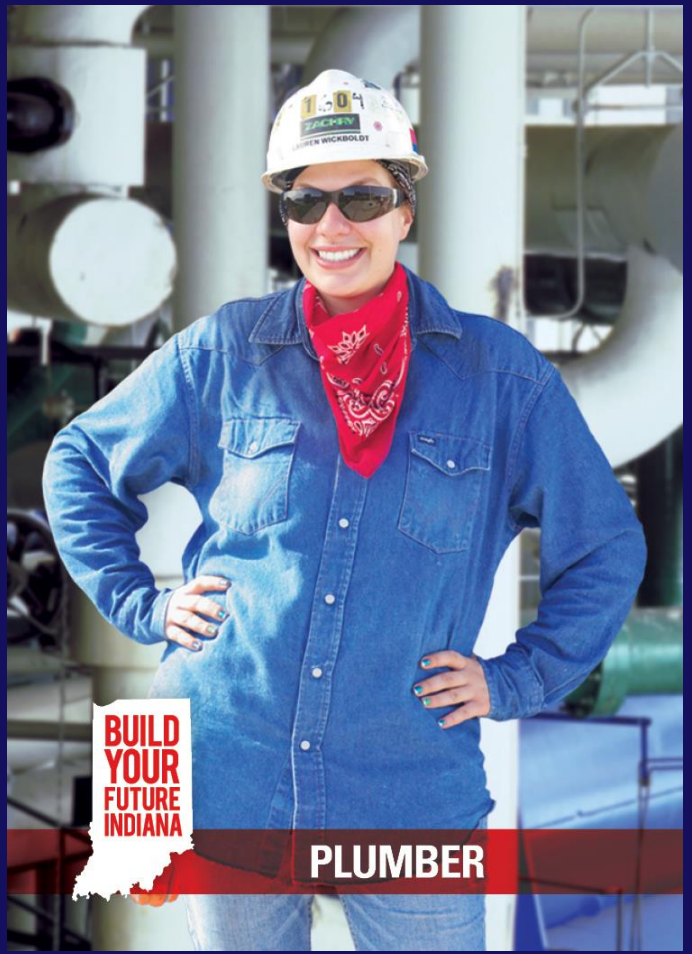
Education Options: Technical School, Community College, Registered Apprenticeship Program, and Industry Training Program

Qualifications: Manual dexterity, coordination, physical fitness, good balance, good color vision (to recognize electrical wires)

https://youtu.be/u5ypG1rdwe8

https://youtu.be/AfSISgTo7QQ

https://youtu.be/Akm2O66z8M0



Finish It: Plumber

Average Salary: $59,627

Description: Design and install piping systems that distribute water and remove waste from buildings, and connect heating and cooling systems

Education Options: Technical School, Community College, Registered Apprenticeship Program, and Industry Training Program

Qualifications: knowledgeable in water distribution, blueprint reading, local ordinances and regulations, mathematics, mechanical drawing, physics, welding, and soldering

https://youtu.be/qnvNZvdqC7c

Finish It: Glazier

Average Salary: $47,480

Description: Select, cut, install, replace, and remove residential, commercial, and artistic glass. Use a variety of tools including glazing knives, saws, drills, grinders, putty, and glazing compounds

Education Options: Technical School, Community College, Registered Apprenticeship Program, and Industry Training Program

Qualifications: Ability to mold and manipulate objects while paying attention to detail. Balance and coordination are a must on ladders and scaffolds.

Finish It: HVAC Technician

Average Salary: $62,472

Description: Install, maintain, and repair heating, ventilation, and air conditioning systems (Can include motors, compressors, pumps, fans, thermostats, and computerized switches control systems, hydronics, solar panels, or commercial refrigeration)

Education Options: Technical School, Community College, Registered Apprenticeship Program, and Industry Training Program

Qualifications: Coordination, physical dexterity, mechanical and mathematical aptitude

Wrap Up

- How much fun did you have today?

Google form:
https://forms.gle/giaVHe9wKvUiHa456