

STEM	Plumbers, Pipefitters & Steamfitters
------	---

TEA Industry Cluster	STEM
SOC Code	47-2152
Identified by	Tech Prep Occupations
Projected Growth (2018)	3 %
BISD Magnet School Available	No

Source: Demand Occupations by Cluster, updated June 27, 2012

Description

What Plumbers, Pipefitters, and Steamfitters Do

Plumbers, pipefitters, and steamfitters install and repair pipes that carry water, steam, air, or other liquids or gases to and in businesses, homes, and factories.

Duties

Plumbers, pipefitters, and steamfitters typically do the following:

- Install pipes and fixtures
- Study blueprints and follow state and local building codes
- Determine the amount of material and type of equipment needed
- Inspect and test installed pipe systems and pipelines
- Troubleshoot and repair systems that are not working
- Replace worn parts

Although plumbers, pipefitters, and steamfitters are three distinct specialties, their duties are often similar. For example, they all install pipes and fittings that carry water, steam, air, or other liquids or gases. They connect pipes, determine the necessary materials for a job, and perform pressure tests to ensure a pipe system is airtight and watertight.

Plumbers, pipefitters, and steamfitters install, maintain, and repair many different types of pipe systems. Some of these systems carry water, dispose of waste, supply gas to ovens, or heat and cool buildings. Other systems, such as those in power plants, carry the steam that powers huge turbines. Pipes also are used in manufacturing plants to move acids, gases, and waste byproducts through the production process.

Master plumbers on construction jobs may be involved with developing blueprints that show where all the pipes and fixtures will go. Their input helps ensure that a structure's plumbing meets building codes, stays within budget, and works well with the location of other features, such as electric wires.

Plumbers and fitters may use many different materials and construction techniques, depending on the type of project. Residential water systems, for example, use copper, steel, and plastic pipe that one or two plumbers can install. Power-plant water systems, by contrast, are made of large steel pipes that usually take a crew of pipefitters to install. Some workers install stainless steel pipes on dairy farms and in factories, mainly to prevent contamination.

Plumbers and fitters sometimes cut holes in walls, ceilings, and floors. With some pipe systems, workers may hang steel supports from ceiling joists to hold the pipe in place. Because pipes are seldom manufactured to the exact size or length, plumbers and fitters measure and then cut and bend lengths of pipe as needed. Their tools include saws, pipe cutters, and pipe-bending machines.

They then connect the pipes, using methods that vary by type of pipe. For example, copper pipe is joined with solder, but steel pipe is often screwed together.

In addition to installation and repair work, journey- and master-level plumbers, pipefitters, and steamfitters often direct apprentices and helpers.

Following are examples of occupational specialties:

Plumbers install and repair water, drainage, and gas pipes in homes, businesses, and factories. They install and repair large water lines, such as those that supply water to buildings, and smaller ones, including ones that supply water to refrigerators. Plumbers also install plumbing fixtures—bathtubs, showers, sinks, and toilets—and appliances such as dishwashers, garbage disposals, and water heaters. They also fix plumbing problems. For example, when a pipe is clogged or leaking, plumbers remove the clog or replace the pipe. Some plumbers maintain septic systems, the large, underground holding tanks that collect waste from houses not connected to a city or county's sewer system.

Pipefitters install and maintain pipes that carry chemicals, acids, and gases. These pipes are mostly in manufacturing, commercial, and industrial settings. They often install and repair pipe systems in power plants, as well as heating and cooling systems in large office buildings. Some pipefitters specialize:

- **Gasfitters** install pipes that provide clean oxygen to patients in hospitals.
- **Sprinklerfitters** install and repair fire sprinkler systems in businesses, factories, and residential buildings.
- **Steamfitters** install pipe systems that move steam under high pressure. Most steamfitters work at campus and natural gas power plants where heat and electricity is generated, but others work in factories that use high-temperature steam pipes.

Training Opportunities Linked to Those Jobs

(Degree Types and Colleges/Universities)

How to Become a Plumber, Pipefitter, and Steamfitter

Most plumbers, pipefitters, and steamfitters learn on the job through an apprenticeship. Some start out by attending a technical school. Most states and localities require plumbers to have a license.

Apprenticeship

A 4- or 5-year apprenticeship is how most plumbers, pipefitters, and steamfitters learn their trade. Each year, apprentices must have at least 1,700 to 2,000 hours of paid on-the-job training and a minimum of 246 hours of related technical education. Apprentices learn safety, local plumbing codes and regulations, and how to read blueprints. They also study mathematics, applied physics, and chemistry. They become familiar with different types of piping systems and plumbing tasks.

After completing an apprenticeship program, plumbers, pipefitters, and steamfitters are considered to be a journey worker, which qualifies them to perform duties on their own.

Apprenticeship programs are offered by unions and businesses. Although most workers enter apprenticeships directly, some start out as helpers. To enter an apprenticeship program, a trainee must meet these requirements:

- Be at least 18 years old
- Have a high school diploma or equivalent
- Pass a basic math test
- Pass a drug test
- Know how to use computers

Education

Technical schools offer courses on pipe system design, safety, and tool use. They also offer welding courses that are considered necessary by some pipefitter and steamfitter apprenticeship training programs.

Licenses

Most states and localities require plumbers to be licensed. Although licensing requirements vary, most states and localities require workers to have 2 to 5 years of experience and to pass an exam that tests their knowledge of the trade and of local plumbing codes before they are permitted to work independently. Several states require a special license to work on gas lines. A few states require pipefitters to be licensed. Getting a license requires a test, experience, or both. Check with the state licensing board.

Important Qualities

Customer service skills. Plumbers work with customers on a regular basis, so they should be polite and courteous.

Managerial skills. Plumbers, pipefitters, and steamfitters—especially those who own their own business—must be able to direct workers, bid on jobs, and plan work schedules. They may have to provide training and choose the right number of workers for a job.

Mechanical skills. Plumbers, pipefitters, and steamfitters use a variety of tools to assemble and repair pipe systems. Choosing the right tool and successfully installing, repairing, or maintaining a system is crucial to their work.

Physical strength. Plumbers, pipefitters, and steamfitters must be strong enough to lift and move heavy pipe.

Troubleshooting skills. Plumbers, pipefitters, and steamfitters find, diagnose, and repair problems. For example, plumbers must be able to perform pressure tests to pinpoint the location of a leak.

Texas Southmost College	South Texas College	Texas State Technical College	University of Texas at Brownsville	University of Texas - Pan American
Plumbing – Solar Thermal Technology (CERT)	Plumber Assistant (CERT)			
Renewable Energy Technology (AAS)				

Local Employers

A & B Electric & Plumbing	Brownsville	L O Gonzalez Central Air & Htg	Rio Hondo
Advanced Cooling	LA Feria	Marine Electric Svc	Port Isabel
George Cunningham CO Inc	Harlingen	Norman's Air Conditioning	Brownsville
Jim Ginther Wholesale Ac	Harlingen	Shorty & Sons Electric	Brownsville
K & S Pools	Harlingen	Viking Cooling & Heating	Brownsville

Career Options (Specific Job Types)

- Plumber
- Journeyman Plumber
- Drain Technician
- Plumber Gasfitter
- Plumbing and Heating Mechanic
- Residential Plumber
- Service Plumber
- Commercial Plumber

Salary Ranges

Wages for Plumbers, Pipefitters, and Steamfitters

Location	Pay Period	2011				
		10%	25%	Median	75%	90%
United States	Hourly	\$13.61	\$17.33	\$22.96	\$31.15	\$39.57
	Yearly	\$28,300	\$36,000	\$47,800	\$64,800	\$82,300
Texas	Hourly	\$12.60	\$15.98	\$20.79	\$25.88	\$29.43
	Yearly	\$26,200	\$33,200	\$43,200	\$53,800	\$61,200
Brownsville-Harlingen, TX MSA	Hourly	\$11.80	\$13.41	\$15.65	\$17.42	\$18.55
	Yearly	\$24,500	\$27,900	\$32,600	\$36,200	\$38,600
McAllen-Edinburg-Mission, TX MSA	Hourly	\$12.03	\$14.26	\$17.18	\$21.21	\$26.29
	Yearly	\$25,000	\$29,700	\$35,700	\$44,100	\$54,700

Professional Associations linked to the Careers

For details about apprenticeship or other opportunities in this trade, contact the offices of the state employment service, the state apprenticeship agency, local plumbing, heating and cooling contractors or firms that employ fitters, or local union-management apprenticeship committees. Apprenticeship information is available from the U.S. Department of Labor's toll-free help line: 1 (877) 872-5627; or [Employment and Training Administration](#).

For more information about apprenticeships for plumbers, pipefitters, and steamfitters, visit [United Association](#)

For more information about plumbers and pipefitters, visit [Mechanical Contractors Association of America](#)
[National Center for Construction Education and Research](#)
[Plumbing-Heating-Cooling Contractors Association](#)

For general information about sprinklerfitters, visit

[American Fire Sprinkler Association](#)

[National Fire Sprinkler Association, Inc.](#)

Sources

The information provided in this document was collected from the following sources:

- Occupational Outlook Handbook (<http://www.bls.gov/ooh/>)
- O*NET OnLine (<http://www.onetonline.org/>)
- Texas CARES (<http://www.texascaresonline.com/>)
- CareerOneStop (<http://www.careeronestop.org/>)

Local Employers

A & B Electric & Plumbing	Brownsville	L O Gonzalez Central Air & Htg	Rio Hondo
A A Puente Plumbing & Repairs	Combes	LA Feria Contractors Inc	LA Feria
A Square Mechanical	Brownsville	Lopez Electric Svc	Brownsville
Acs	Brownsville	Marathon Electric	Brownsville
Action Air Inc	Brownsville	Marine Electric Svc	Port Isabel
Advanced Air Conditioning CO	Harlingen	Metro Cable Svc Inc	Harlingen
Advanced Cooling	LA Feria	Metro Electric Inc	Brownsville
Air Control A/C & Heating	Harlingen	Metro Electric Inc	Harlingen
Airs CO	Harlingen	Mobile Mini Inc	Harlingen
Alfa Electric	Brownsville	Mota's Refrigeration	Brownsville
Alfaro Electric	Brownsville	Motor Pool	Brownsville
Aloha Pools of Texas	Brownsville	Mr Rooter Plumbing & Septic	Brownsville
Amf Mechanical Corp	Brownsville	Norman's Air Conditioning	Brownsville
Aquarius Pools Inc	Harlingen	Pike Electric Corp	Harlingen
Atkinson Electric	Brownsville	Pipe's Plumbing	Harlingen
B & B Svc	LA Feria	Pizana Plumbing CO	Brownsville
Ballenger Construction CO	Harlingen	Portable Building CO	Harlingen
Benny's Aire Inc	Harlingen	Professional Plumbing	Harlingen
Berry Pool & Supply	Brownsville	Quality Electric Primera	Harlingen
Borchers Electric	Harlingen	Ramos Electric	Brownsville
Bud's Quality Plumbing	Harlingen	Reliable Electric	Port Isabel
Central Air & Heating Svc Inc	Harlingen	Rick's Plumbing	Brownsville
Coastal Mechanical Svc Ltd	San Benito	Rio Mechanical Inc	Harlingen
Commercial Electric	Harlingen	Rios Air Conditioning	Brownsville
Contract Service & Supply Inc	South Padre Island	River Valley Construction Ctr	Harlingen
Cornett Construction CO	San Benito	Roman's Plumbing	Harlingen
Cto Inc	Harlingen	Royal Metal Building Component	San Benito
D I Longoria Svc CO	Brownsville	Royal Refrigeration & Air Cond	Brownsville
Dave's Service Tech	Brownsville	Ruben's Electric	Harlingen
Gallegos Electric Inc	Brownsville	Sais Commercial Systems	Brownsville
Garcia's Electric	Brownsville	Schumacher Electric Corp	Brownsville
George Cunningham CO Inc	Harlingen	Serv-All Sales & Svc	Brownsville

Global Electric	Brownsville	Shorty & Sons Electric	Brownsville
Golden Touch Pools	Harlingen	Snyder Air Conditioning	Harlingen
Gomez Basilio	Brownsville	Snyder Commercial Svc CO	Harlingen
Gonzalez Electric & Plumbing	Harlingen	South Texas Pool Supply	LA Feria
Gonzalez Plumbing	Brownsville	South Texas Splash Pools	LA Feria
Gulf Coast Mechanical Contrs	LA Feria	Spellman High Voltage Elect	Brownsville
Hamilton Electric	San Benito	Sun Tex Mechanical	San Benito
Harlingen Plumbing	Harlingen	Suncoast Air Cond & Refrig	Harlingen
Harlingen Plumbing	Harlingen	Sunwave Air Conditioning & Htg	Olmito
Hess Air Inc	Harlingen	Temp Control Inc	Brownsville
Hispania Development CO Inc	Brownsville	Terry Ray Construction Inc	Brownsville
Houston Stafford Electric Inc	LA Feria	Toromont Energy Systems	Brownsville
Innovative Electrical Tech	Harlingen	Tropical Air Conditioning CO	Los Fresnos
J & L Commercial & Residential	Port Isabel	Tuff Shed Inc	LA Feria
J D Electric	Harlingen	Two Seasons Air Conditioning	Brownsville
J R's Electric	Harlingen	Valley Weathermakers	Harlingen
Janitrol Distributors	Harlingen	Viking Cooling & Heating	Brownsville
Jim Ginther Wholesale Ac	Harlingen	Villarreal Manuel	Harlingen
K & S Pools	Harlingen	White Electric	Harlingen
K K Busters Plumbing	Brownsville	Wood Master Building CO	LA Feria
Kelteck Heating & Cooling Inc	Harlingen	-	-



Plumbers, Pipefitters & Steamfitters

Cluster Overview: Planning, managing, and providing scientific research and professional and technical services including laboratory and testing services, and research and development services.

Career Goal (O*NET Code): (47-2152) - Plumbers, pipefitters, and steamfitters install and repair pipes that carry water, steam, air, or other liquids or gases to and in businesses, homes, and factories. They all install pipes and fittings that carry water, steam, air, or other liquids or gases. They connect pipes, determine the necessary materials for a job, and perform pressure tests to ensure a pipe system is airtight and watertight.

Student Name: _____
Grade: _____
School: _____

SUGGESTED COURSEWORK

EXTENDED LEARNING EXPERIENCES

Middle School	8th	HS Courses:	(Local districts may list high school credit courses here)	<p>Curricular Experiences***:</p> <p>BEST Robotics, Inc. FIRST Robotics Competition Project Lead the Way Skills USA Technology Student Association The Infinity Project</p> <p>Career Learning Experiences:</p> <p>Career Preparation Job Shadowing Internship</p>	<p>Extracurricular Experiences:</p> <p>Destination ImagiNation International Bridge Building Contest Marine Advanced Technology Education Center National Engineering Design Competition UIL Academic Competitions VEX Robotics Competition</p> <p>Service Learning Experiences:</p> <p>Campus Service Organizations Community Service Volunteer Peer Mentoring/Peer Tutoring</p>		
High School	9th	Courses*:	English I Algebra I or Geometry Biology			World Geography Foreign Language I Physical Education or Athletics	<p>COLLEGE CREDIT OPPORTUNITIES -- High School</p> <p>Students should take Advanced Placement (AP), International Baccalaureate (IB), dual credit, Advanced Technical Credit (ATC), or locally articulated courses (Tech Prep), if possible. List those courses that count for college credit on your campus.</p>
		Career-Related Electives:	Concepts of Engineering & Technology				
	10th	Courses:	English II Geometry or Algebra II Chemistry			World History Foreign Language II Elective	
		Career-Related Electives:	Engineering Design & Presentation				
	11th	Core Courses:	English III Algebra II or Pre-Calculus Physics			United States History Foreign Language III ** Professional Communications or Speech	
		Career-Related Electives:	Advanced Engineering Design & Presentation				
	12th	Core Courses:	English IV Pre-Calculus or Calculus 4th Science			Government/Economics Elective Elective	
		Career-Related Electives:	Practicum in STEM				
	<p>How to Become a Plumber, Pipefitter, and Steamfitter</p> <p>Most plumbers, pipefitters, and steamfitters learn on the job through an apprenticeship. Some start out by attending a technical school. Most states and localities require plumbers to have a license.</p>						<p>Professional Associations:</p> <ul style="list-style-type: none"> • United Association • Mechanical Contractors Association of America • National Center for Construction Education and Research • Plumbing-Heating-Cooling Contractors Association • American Fire Sprinkler Association • National Fire Sprinkler Association, Inc.
Postsecondary		<p>Texas Southmost College South Texas College Texas State Technical College</p>					
		Plumbing – Solar Thermal Technology (CERT) Renewable Energy Technology (AAS)	Plumber Assistant (CERT)			<p>Career Options:</p> <ul style="list-style-type: none"> • Plumber • Journeyman Plumber • Drain Technician • Plumber Gasfitter • Plumbing and Heating Mechanic • Residential Plumber • Service Plumber • Commercial Plumber 	
		<p>The University of Texas at Brownsville The University of Texas - Pan American</p>					
					<p>Career Options:</p>		

* Students must meet local & state high school graduation requirements. ** Required course for the Distinguished Graduation Plan (in addition to other measures). *** Based on campus availability. Students may select other elective courses for personal enrichment purposes.

This plan of study serves as a guide, along with other career planning materials, for pursuing a career path and is based on the most recent information as of 2009. All plans meet high school graduation requirements as well as college entrance requirements.