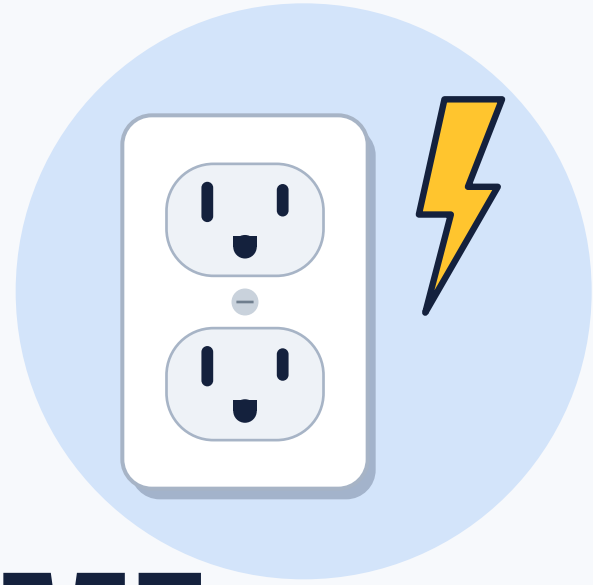
vifalio

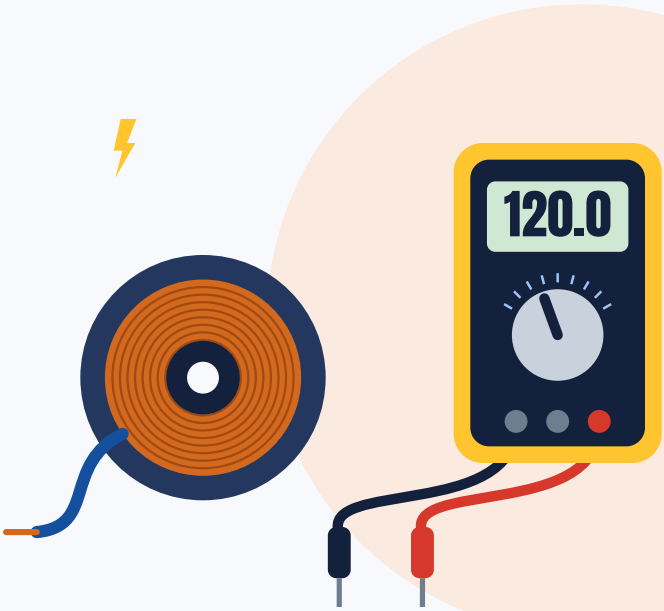
FREE GUIDE · ELECTRICAL CAREER



HOW TO BECOME AN ELECTRICIAN IN THE USA

From zero to your first job and your journeyman license: apprenticeship, trade school or helper, hours, the NEC exam, tools and English for the job.

- Pay by state + the 5-step path
- Apprentice, journeyman, master
- License rules in 10 big states
- 40 NEC-style practice questions
- 90-day checklist + resume



HOW TO USE THIS GUIDE

Read it in order the first time. Then come back to the study pages and the practice test as often as you need.

1 SEE THE JOB

Pages 3-4: what electricians do and what they earn in each state (estimates).

2 PICK YOUR ROUTE

Pages 5-6: the 5 steps and the 4 ways in: union, merit shop, school or helper.

3 UNDERSTAND LICENSES

Pages 7-8: apprentice, journeyman, master, and what 10 big states ask for.

4 GET READY

Pages 9-10: first tools with costs and 30 job terms in English and Spanish.

5 STUDY + PRACTICE

Pages 11-19: NEC, theory, safety, then 40 questions with answers.

6 START NOW

Pages 20-21: a 90-day checklist, a helper resume and ready messages.

WHAT'S INSIDE

3 What an electrician does
4 Pay by state (estimates)
5 The path in 5 steps
6 4 ways to get trained
7 Apprentice to master
8 License rules: 10 big states
9 First tools and costs
10 Glossary: 30 terms EN / ES
11 Study: how the NEC works
12 Study: key NEC numbers
13 Study: theory and math
14 Study: safety on the job
15 Practice: theory and math
16 Practice: wires and circuits
17 Practice: boxes, GFCI, space
18 Practice: safety and the job
19 Answer key with explanations
20 Your 90-day checklist
21 Resume + messages

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

WHAT AN ELECTRICIAN DOES

You install, maintain and repair the wiring, panels, lights and equipment that bring power to homes, businesses and factories.

~$63,000	< ~$43,000	> ~$108,000	+9%
Median pay per year	Lowest 10% earn less than	Highest 10% earn more than	Job growth, 2025-2035
About $30 per hour · May 2025	Annual pay · May 2025	Annual pay · May 2025	Faster than average

About 821,000 jobs in 2025 · about 72,700 openings per year over the decade

A NORMAL WEEK ON THE JOB

- Read plans and lay out boxes, panels and circuits
- Bend conduit and pull wire (rough-in)
- Install outlets, switches, fixtures and breakers (trim-out)
- Test circuits and find faults with a meter
- Follow the NEC and pass the inspection
- Work safely: lockout, PPE, ladders

WHY THERE IS DEMAND

- Solar panels, batteries and EV chargers all need electricians.
- New homes, data centers and factories need power and wiring.
- Many electricians retire each year and must be replaced.

WHERE ELECTRICIANS WORK

Electrical contractors · New construction · Service and repair · Factories and plants · Solar and EV · Your own company, later

HOW YOU GROW

Helper — Carry, pull wire, learn

Apprentice — Paid training + classes

Journeyman — Licensed, works on own

Master — Plans jobs, supervises

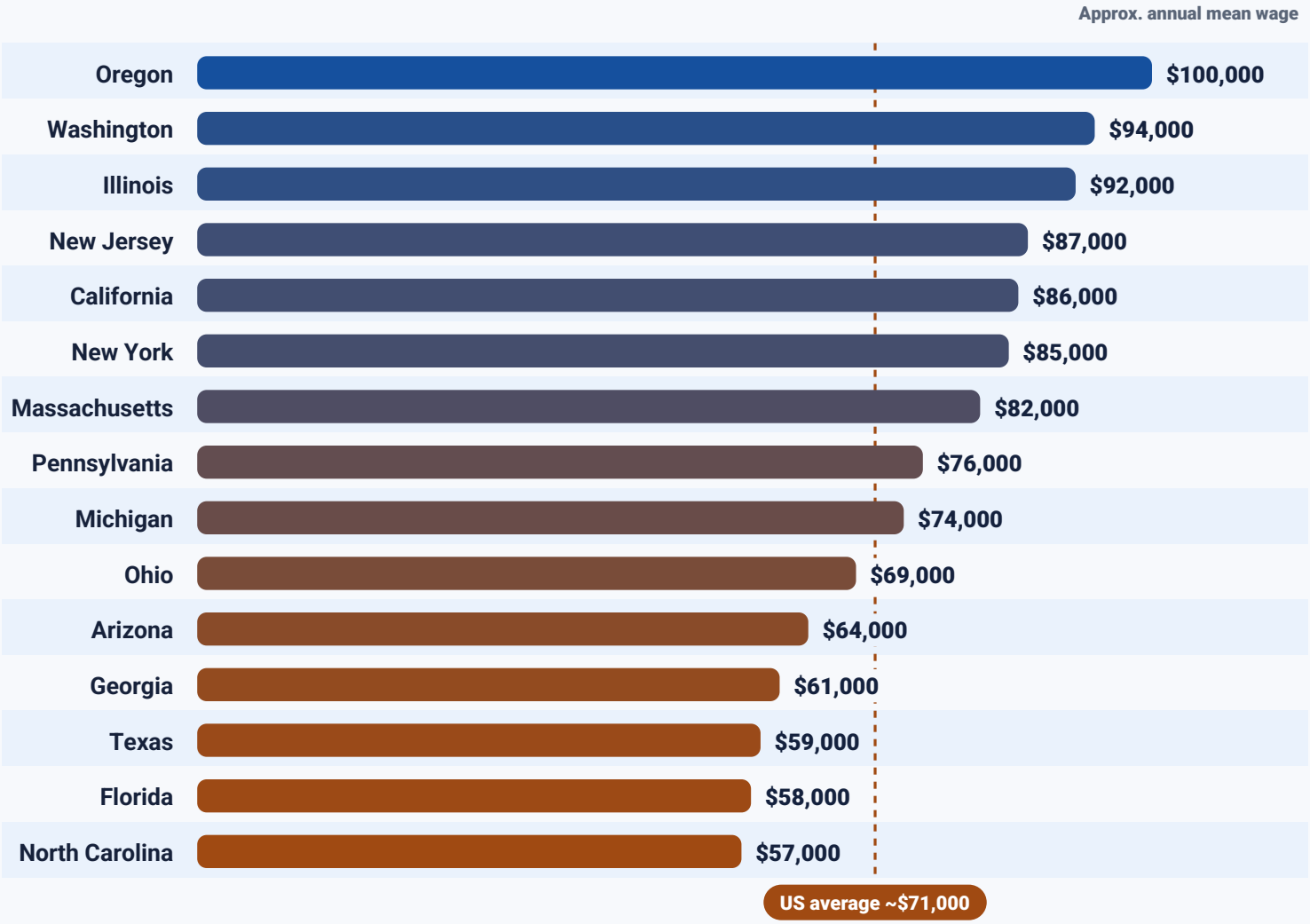
Contractor — Own business (license where required)

Source: U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, Electricians (pay for May 2025, rounded). National figures; pay varies by state, experience, union status and employer. Not a promise of income.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

PAY BY STATE (ESTIMATES)

Average yearly pay for electricians in 15 states, from highest to lowest. Rounded to the nearest $1,000.



HOW TO READ THESE NUMBERS

- These are averages for all electricians, apprentices to masters. Your first year will usually be lower.
- High-pay states often have a high cost of living (rent, gas, food). Compare both before you move.
- Apprentices are often paid a % of the journeyman rate, with a raise each year or level.
- Overtime, union benefits and per diem on travel jobs can change the total a lot.

Source: BLS Occupational Employment and Wage Statistics (OEWS), May 2025, Electricians (SOC 47-2111), annual mean wage by state. Values rounded; treat them as estimates, not offers.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

THE PATH IN 5 STEPS

Most electricians follow this order. You can earn money from step 2 on.

1

THE BASICS

Weeks to a few months

Be 18 or older. Most apprenticeships ask for a high school diploma or GED and one year of algebra. A driver's license and reliable transport help a lot.

2

GET INTO TRAINING

Start as soon as you can

Join an apprenticeship, a trade school or a helper job (page 6). Some states make you register as an apprentice or trainee before your hours count.

3

LOG YOUR HOURS

About 4 to 5 years

Typical goal: about 8,000 hours of supervised work (2,000 h x 4 years), plus classes. Keep pay stubs and signed letters from every employer.

4

PASS THE JOURNEYMAN EXAM

When your hours are done

A timed test based on the National Electrical Code (NEC) and theory. Where there is no state license, the city or county runs it (page 8).

5

GROW

After your license

Master license, contractor license or a specialty: solar, EV chargers, industrial controls, low voltage, inspection or estimating.

Hours and steps vary by state and program. Always check the rules where you will work.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

4 WAYS TO GET TRAINED

Pick by your time, your money and how you learn. All four can lead to a journeyman license.

UNION APPRENTICESHIP (IBEW + NECA)

TIME
4 to 5 years

COST (ESTIMATE)
Low: books and fees

PAID WHILE YOU LEARN?
Yes. Pay rises as you advance

PROS
- Classes + work with a mentor
- Benefits and set raises

CONS
- Aptitude test, interview, waitlist
- Few spots in some areas

MERIT SHOP APPRENTICESHIP (IEC OR ABC)

TIME
About 4 years

COST (ESTIMATE)
Tuition varies; employers may help

PAID WHILE YOU LEARN?
Yes. You work for a member contractor

PROS
- Night classes, many local chapters
- Often easier to start

CONS
- You may need to find the employer
- Benefits depend on the company

TRADE SCHOOL / COMMUNITY COLLEGE

TIME
6 months to 2 years

COST (ESTIMATE)
$2,000 - $20,000+

PAID WHILE YOU LEARN?
No (night classes let you work)

PROS
- Theory and labs fast
- Job placement help

CONS
- You pay tuition
- School hours may count only in part

HELPER / TRAINEE JOB

TIME
Start now

COST (ESTIMATE)
$0 - $300 (basic tools)

PAID WHILE YOU LEARN?
Yes, from day one

PROS
- Paid from the first week
- Real job sites right away

CONS
- Learning depends on your boss
- Register as trainee where required

HOW TO GET INTO AN APPRENTICESHIP

1. Find programs near you: search "electrical apprenticeship [your city]" and apprenticeship.gov.
2. Gather documents: ID, diploma or GED, transcript with algebra, driver's license.
3. Prepare for the aptitude test: algebra and reading. Practice a few weeks.
4. Interview: show you are on time, safe and ready to learn. Apply to more than one.

Program length and pay structure vary by local program. Costs are estimates. IBEW, NECA, IEC and ABC are named only as examples; this guide is not affiliated with them.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

APPRENTICE, JOURNEYMAN, MASTER

Most states and cities use these levels. The names and the hours change from place to place.

APPRENTICE / TRAINEE

Day 1

Works under a licensed electrician. Some states ask you to register. Classes in many programs: about 144 h per year.

JOURNEYMAN

~8,000 h

After about 4 years of documented work, pass an exam based on the NEC. Can work without direct supervision.

MASTER

More years

More experience (Texas, for example: 12,000 h and 2 years as journeyman) and a harder exam. Can plan and supervise jobs.

CONTRACTOR

Business

Licensed company: may need a master on staff, insurance, bond and a business exam. Pulls permits.

THE HOURS, IN NUMBERS

2,000 h
per year of full-time work

x 4 years
a typical apprenticeship

= 8,000 h
common journeyman goal

+ 576 h
classes (144 h x 4 years) in many programs

THE JOURNEYMAN EXAM

- Multiple choice and timed. Topics: definitions, wiring methods, grounding, boxes, load calculations, motors and theory.
- Based on the NEC edition your state or city adopted. Ask which edition before you study.
- Many exams let you bring the code book; some do not. Check the candidate bulletin.
- Passing score and retake rules are set by each state or exam provider.

This page is a general guide, not legal advice. Hours, exams and names change. Always confirm with your state licensing board and your city or county.

Sources: BLS Occupational Outlook Handbook (apprenticeships: 2,000 h of paid training per year); TDLR (Texas). Typical hours shown as estimates.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

LICENSE RULES IN 10 BIG STATES

Some states license electricians statewide. Others license only contractors, or leave it to each city or county.

State	Statewide journeyman license?	Where to check	Notes
California	Yes (state certification)	DIR (state); CSLB for contractors	Register as a trainee first. General electrician: about 8,000 h.
Texas	Yes	TDLR	Journeyman: about 8,000 h. Master: 12,000 h + 2 years as journeyman.
Florida	No (contractors only)	DBPR / ECLB; your county	Journeyman cards are often issued by counties.
New York	No (local)	Your city or county (ex: NYC)	Rules change from town to town.
Pennsylvania	No (local)	Your city or township	Big cities like Philadelphia have their own licenses.
Illinois	No (local)	Your city (ex: Chicago)	Many towns license contractors and register workers.
Ohio	No (contractors only)	OCILB; your city	The state licenses commercial electrical contractors.
Georgia	No (contractors only)	State construction licensing board	Contractor classes for different job sizes.
North Carolina	No (contractors only)	State electrical contractors board	Check city or county rules for workers.
Michigan	Yes	LARA (state)	Journeyman: about 8,000 h + classroom hours. Master: more.

CHECK THE BOARD IN YOUR STATE. This table is a simplified summary from public information (2026) and can be out of date. Search "[your state] electrical license", open only .gov websites, and call your city or county building department.

MOVING TO ANOTHER STATE?

Some states have reciprocity agreements that accept a journeyman license from another state, usually with conditions. Keep copies of your license, hours and exam results.

Agency names are given only so you know where to check. This guide is independent and not issued or approved by any of them.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

YOUR FIRST TOOLS

Buy in stages. Ask your employer first: many companies supply power tools, benders and ladders.

Tool	Estimated cost	When
Lineman's pliers (9 inch)	$25 - $60	Day 1
Wire strippers	$15 - $40	Day 1
Diagonal cutters	$15 - $40	Day 1
Needle-nose pliers	$12 - $35	Day 1
Screwdrivers + multi-bit driver	$20 - $60	Day 1
Non-contact voltage tester	$15 - $35	Day 1
Multimeter or clamp meter	$40 - $200	Month 1
Tape measure (25 ft)	$10 - $30	Day 1
Torpedo level	$10 - $25	Month 1
Tool pouch, belt or bag	$30 - $120	Day 1
Safety glasses, gloves, hard hat	$30 - $80	Day 1
Fish tape	$25 - $60	Month 2
Cordless drill / impact driver kit	$100 - $300	Often supplied
Conduit bender (1/2 inch EMT)	$35 - $70	Often supplied
TOTAL (ALL 14 ITEMS)	**$382 - $1,155**	

- Buy insulated, quality hand tools first. Borrow the expensive ones until you know what you use.
- Never use a tool with cracked insulation or a meter with damaged leads.
- Label your tools and keep the receipts. Ask a tax preparer what you can deduct.

Costs: rough estimates of 2026 US store and online prices. They change by brand and store.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

JOB ENGLISH: 30 TERMS

The words you will hear on every job site. Useful for crews that mix English and Spanish.

English	Español
1. Wire / conductor	Cable / conductor
2. Breaker	Breaker (interruptor)
3. Panel	Panel / centro de carga
4. Outlet / receptacle	Contacto / tomacorriente
5. Switch	Apagador
6. Ground	Tierra
7. Neutral	Neutro
8. Hot wire	Cable vivo (fase)
9. Conduit	Tubo conduit
10. Junction box	Caja de conexiones
11. Wire nut	Capuchón (wire nut)
12. Voltage	Voltaje
13. Current (amps)	Corriente (amperes)
14. Load	Carga
15. Short circuit	Cortocircuito

English	Español
16. Ground fault	Falla a tierra
17. Lockout / tagout	Bloqueo y etiquetado
18. Fish tape	Guía pasacables
19. Wire stripper	Pelacables
20. Multimeter	Multímetro
21. Service entrance	Acometida
22. Meter	Medidor
23. Light fixture	Lámpara / luminaria
24. Rough-in	Obra negra (rough-in)
25. Trim-out	Acabado (trim-out)
26. Pull wire	Jalar cable
27. Conduit bender	Dobladora de tubo
28. Permit	Permiso
29. Inspection	Inspección
30. Code (NEC)	Código (NEC)

5 PHRASES FOR THE JOB

Is the breaker off? Lock it out first.	¿Está apagado el breaker? Primero bloquéalo.
Pull three twelve-gauge wires to this box.	Jala tres cables calibre 12 a esta caja.
This outlet needs GFCI protection.	Este contacto necesita protección GFCI.
I tested it: the circuit is dead.	Ya lo probé: el circuito está muerto (sin voltaje).
The inspector comes tomorrow at nine.	El inspector viene mañana a las nueve.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

STUDY · HOW THE NEC IS ORGANIZED

The National Electrical Code (NFPA 70) is the rule book most US cities and states adopt. Learn to find things fast.

Chapter	What it covers (examples of articles)
1	General: definitions (Art. 100) and general requirements (Art. 110)
2	Wiring and protection: branch circuits (210), services (230), overcurrent (240), grounding (250)
3	Wiring methods and materials: conductors (310), boxes (314), NM cable (334), EMT (358)
4	Equipment for general use: switches (404), receptacles (406), panelboards (408), motors (430)
5 - 7	Special occupancies, special equipment (pools 680, solar 690) and special conditions
8 - 9	Communications systems; tables such as conduit fill and conductor properties

HOW TO READ A RULE

- Chapter > Article > Part > Section. Example: 210.8(A) is Article 210, Section 8, list item A.
- Exceptions come right after the rule they change.
- Start with the index at the back: it is faster than flipping pages.

EXAM TIPS

- If the book is allowed, tab the main articles before the test.
- Answer the easy questions first; mark the hard ones and come back.
- Read every word: "dwelling", "continuous" and "copper" change the answer.

WORDS THAT MATTER

- "Shall" = required. "Shall not" = not allowed.
- Informational notes explain; they are not rules.
- AHJ = authority having jurisdiction: the inspector or office that enforces the code.

EDITIONS

- A new edition comes out every 3 years.
- Each state or city adopts an edition on its own schedule, sometimes with changes.
- Ask which edition your exam uses and study that one.

MEMORIZE

Article 100 = definitions

Chapter 9 = tables

New edition every 3 years

Summary for study only. Always use the full NEC edition adopted in your area, OSHA rules and NFPA 70E. Section numbers follow recent NEC editions.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

STUDY · KEY NEC NUMBERS

Numbers that show up on the job and on almost every exam. Copper wire, typical dwelling rules.

Item	Typical rule
14 / 12 / 10 AWG copper	Overcurrent protection no more than 15 / 20 / 30 A (small conductor rule, 240.4(D))
Box fill per conductor	14 AWG = 2.00 cu. in. · 12 AWG = 2.25 · 10 AWG = 2.50 (314.16)
Continuous load	Breaker sized at 125% of it, so the load is 80% of the breaker or less
Conduit fill, 3 or more wires	40% of the conduit area (Chapter 9, Table 1)
Working space at panels	30 in wide (or the equipment width), 6.5 ft high, 3 ft deep at 150 V or less to ground

GFCI IN HOMES (210.8)

- Protects people from shock. Trips at about 4 to 6 mA.
- Common locations: bathrooms, kitchens, garages, outdoors, basements, laundry areas and near sinks.
- The list grows with each edition: check the one your area uses.

BOX FILL, STEP BY STEP

- Count each wire that enters and ends or splices in the box: 1 each.
- Each device (switch or receptacle): 2, by its largest wire. Up to 4 grounds together: 1.
- Example: 4 x 12 AWG + 1 receptacle + grounds = 7 x 2.25 = 15.75 cu. in.

AFCI IN HOMES (210.12)

- Protects against arcing faults that can start fires.
- Required for most living areas: bedrooms, living rooms, kitchens, hallways, closets and more.

RECEPTACLE SPACING

- Wall rule: no point along the floor line more than 6 ft from a receptacle.
- So receptacles can be up to 12 ft apart.
- Kitchen counters: no point along the wall more than 24 in from a receptacle.

MEMORIZE

14 / 12 / 10 AWG = 15 / 20 / 30 A

Box fill: 2.00 / 2.25 / 2.50 cu. in.

6 ft wall rule · 24 in counter

Summary for study only. Always use the full NEC edition adopted in your area, OSHA rules and NFPA 70E. Section numbers follow recent NEC editions.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

STUDY · THEORY AND MATH

Most exams have calculation questions. These formulas solve the majority of them.

Formula	Use it to find
V = I x R	Voltage (V) from current in amps (I) and resistance in ohms (R)
I = V / R · R = V / I	Current or resistance when you know the other two
P = V x I · I = P / V	Power in watts, or the current a load draws
Series: R = R1 + R2 + ...	Total resistance when parts are in a line
Parallel: R = (R1 x R2) / (R1 + R2)	Two parts side by side. Two equal parts: half of one
3-phase: VLL = VLN x 1.732	208Y/120 V and 480Y/277 V systems

WORKED EXAMPLES

- 1,500 W heater on 120 V: I = 1,500 / 120 = 12.5 A.
- 5,760 W water heater on 240 V: I = 5,760 / 240 = 24 A.
- 20 A circuit at 120 V: 2,400 W max; 80% for continuous loads = 1,920 W.

QUICK CHECKS

- Bigger AWG number = thinner wire.
- Two 10 ohm parts: 20 ohms in series, 5 ohms in parallel.
- Write the formula first, then put in the numbers with units.

POWER IN THE US

- Homes: 120/240 V single-phase, 60 Hz.
- Commercial: often 208Y/120 V or 480Y/277 V three-phase.
- Line to neutral on 208Y/120: 208 / 1.732 = 120 V.

VOLTAGE DROP

- Drop = current x resistance of the wires (both ways).
- Example: 16 A x 0.4 ohm = 6.4 V lost in the wires.
- An informational note suggests about 3% for branch circuits: 3.6 V on 120 V.

MEMORIZE

V = I x R

P = V x I

208 = 120 x 1.732

Summary for study only. Always use the full NEC edition adopted in your area, OSHA rules and NFPA 70E. Section numbers follow recent NEC editions.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

STUDY · SAFETY ON THE JOB

Electricity does not give second chances. These habits protect you from day one.

Hazard	How you prevent it
Shock	De-energize, lock out and test before you touch. Insulated tools. No rings or watches.
Arc flash	Do not work live unless trained and authorized. Use the PPE the label and NFPA 70E call for.
Falls	Fiberglass ladder, 3 points of contact, set at about 4 to 1. Fall protection when required.
Cuts and eyes	Safety glasses always. Gloves when cutting, stripping and pulling wire.
Heat and dust	Water, shade and breaks in attics. Dust mask when drilling or cutting.

LOCKOUT / TAGOUT

- Tell people, then turn the circuit off at the breaker or disconnect.
- Put on your own lock and tag. Only you remove them.
- Test that it is dead before you work.

NEVER

- Never put a bigger breaker on a wire to stop it from tripping.
- Never trust a panel label without testing.
- Never work alone in a risky place.

TEST BEFORE TOUCH

- Live-dead-live: test the meter on a known live source, test the circuit, then test the meter again.
- A non-contact tester is a first check, not proof.

TRAINING THAT HELPS

- OSHA 10-hour construction: basic job site safety, often asked by employers.
- First aid and CPR.
- NFPA 70E training before any work near live parts.

MEMORIZE

Off, lock, tag, test

Live-dead-live

Fiberglass ladders

Summary for study only. Always use the full NEC edition adopted in your area, OSHA rules and NFPA 70E. Section numbers follow recent NEC editions.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

PRACTICE · THEORY AND MATH

10 original NEC-style questions. Circle one answer each. Answers and explanations on page 19.

1 **A 1,800 W heater runs on 120 V. How much current does it draw?**

(A) 15 A
(B) 10 A
(C) 12 A
(D) 20 A

2 **240 V is applied across a 48 ohm resistance. What is the current?**

(A) 10 A
(B) 4.8 A
(C) 5 A
(D) 0.2 A

3 **The unit of electrical resistance is the:**

(A) Volt
(B) Ohm
(C) Ampere
(D) Watt

4 **Two 10 ohm resistors are connected in parallel. Total resistance?**

(A) 100 ohms
(B) 10 ohms
(C) 20 ohms
(D) 5 ohms

5 **In a 208Y/120 V three-phase system, the voltage from any phase to neutral is:**

(A) 240 V
(B) 208 V
(C) 120 V
(D) 277 V

6 **Which formula gives power in watts?**

(A) Volts x amps
(B) Volts / amps
(C) Amps / ohms
(D) Ohms x watts

7 **A 20 A, 120 V circuit at its full rating carries how much power?**

(A) 6 W
(B) 1,920 W
(C) 1,200 W
(D) 2,400 W

8 **A breaker for a continuous load is sized at 125% of the load. So the load should be at most:**

(A) 50% of the rating
(B) 80% of the rating
(C) 100% of the rating
(D) 125% of the rating

9 **A 5,760 W water heater runs on 240 V. What current does it draw?**

(A) 12 A
(B) 48 A
(C) 24 A
(D) 30 A

10 **A circuit carries 16 A. Its two wires have 0.4 ohm in total. Voltage drop?**

(A) 40 V
(B) 6.4 V
(C) 0.025 V
(D) 16.4 V

Original practice questions for study. Not taken from any real exam. Always check the NEC edition used in your area.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

PRACTICE - WIRES AND CIRCUITS

10 original NEC-style questions. Circle one answer each. Answers and explanations on page 19.

11 **The National Electrical Code is published as:**

(A) IEEE 1
(B) OSHA 1910
(C) UL 943
(D) NFPA 70

12 **A new edition of the NEC is published every:**

(A) Year
(B) 3 years
(C) 5 years
(D) 10 years

13 **Unless a rule allows otherwise, 12 AWG copper is protected at no more than:**

(A) 20 A
(B) 15 A
(C) 25 A
(D) 30 A

14 **Same rule: 10 AWG copper is protected at no more than:**

(A) 40 A
(B) 20 A
(C) 30 A
(D) 50 A

15 **In the AWG system, a BIGGER gauge number means:**

(A) A thinner wire
(B) A thicker wire
(C) More insulation
(D) An aluminum wire

16 **An insulated grounded (neutral) conductor is normally:**

(A) Blue only
(B) Green
(C) Black or red
(D) White or gray

17 **An insulated equipment grounding conductor is:**

(A) White
(B) Green, or green with yellow stripes
(C) Gray
(D) Red

18 **Conduit fill and conductor property tables are in:**

(A) Chapter 4
(B) Chapter 1
(C) Chapter 9
(D) Chapter 7

19 **Article 100 of the NEC contains:**

(A) Definitions
(B) Grounding rules
(C) Motor rules
(D) Swimming pool rules

20 **Max conduit fill for 3 or more conductors:**

(A) 60%
(B) 31%
(C) 53%
(D) 40%

Original practice questions for study. Not taken from any real exam. Always check the NEC edition used in your area.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

PRACTICE - BOXES, GFCI, SPACE

10 original NEC-style questions. Circle one answer each. Answers and explanations on page 19.

21 **Box fill allowance for each 12 AWG conductor:**

(A) 2.00 cu. in. (B) 2.25 cu. in.
(C) 2.50 cu. in. (D) 3.00 cu. in.

22 **In box fill, a switch or receptacle counts as:**

(A) 4 conductors (B) 1 conductor
(C) 0 conductors (D) 2 conductors

23 **Three equipment grounding wires in one box count together as:**

(A) 3 conductors (B) 0 conductors
(C) 1 conductor (D) 2 conductors

24 **A box has four 12 AWG wires, one receptacle and the grounds. Minimum volume?**

(A) 15.75 cu. in. (B) 13.50 cu. in.
(C) 11.25 cu. in. (D) 18.00 cu. in.

25 **In a dwelling, which location needs GFCI for 125 V, 15 and 20 A receptacles?**

(A) Hallways (B) Bedrooms
(C) Bathrooms (D) Living rooms

26 **What does an AFCI protect against?**

(A) Ground faults that shock people (B) Arcing faults that can start fires
(C) Lightning strikes (D) Low voltage from the utility

27 **A GFCI for people trips at a ground fault of about:**

(A) 20 amps (B) 30 milliamps
(C) 15 amps (D) 4 to 6 milliamps

28 **Dwelling wall rule: no point along the floor line more than ___ from a receptacle.**

(A) 6 ft (B) 12 ft
(C) 4 ft (D) 10 ft

29 **Kitchen counter: no point along the wall line more than ___ from a receptacle.**

(A) 36 in (B) 12 in
(C) 24 in (D) 48 in

30 **Minimum width of working space in front of a panel:**

(A) 24 in (B) 30 in (or the equipment width)
(C) 18 in (D) 48 in

Original practice questions for study. Not taken from any real exam. Always check the NEC edition used in your area.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

PRACTICE - SAFETY AND THE JOB

10 original NEC-style questions. Circle one answer each. Answers and explanations on page 19.

31 **Before you work on a circuit, you should:**

- (A) Only put on gloves
- (B) Trust the label on the panel
- (C) Turn it off, lock and tag it, and test it
- (D) Ask the owner if it is off

32 **When should you check your voltage tester on a known live source?**

- (A) Before and after testing the circuit
- (B) Never, testers do not fail
- (C) Once a year
- (D) Only when it is new

33 **NFPA 70E is about:**

- (A) Elevators
- (B) Fire sprinklers
- (C) Plumbing
- (D) Electrical safety in the workplace, like arc flash

34 **The OSHA 10-hour construction course gives you:**

- (A) A journeyman license
- (B) Basic job site safety training
- (C) A master license
- (D) A driver's license

35 **The best ladder for electrical work is made of:**

- (A) Any metal
- (B) Aluminum
- (C) Steel
- (D) Fiberglass

36 **Why take off rings and metal watches on the job?**

- (A) Metal conducts and can burn or shock you
- (B) They slow you down
- (C) Customers do not like them
- (D) They scratch tools

37 **A breaker keeps tripping. What is the right move?**

- (A) Tape the handle on
- (B) Put in a bigger breaker
- (C) Find the cause: overload, short or ground fault
- (D) Use a bigger fuse

38 **Which proof of your work hours should you keep?**

- (A) Nothing, the state has it
- (B) Pay stubs, W-2s and signed letters
- (C) Only photos of your work
- (D) A text from a friend

39 **A journeyman license usually requires:**

- (A) Only an online course
- (B) Only a diploma
- (C) Only buying tools
- (D) Documented hours and an NEC-based exam

40 **In a city, who decides if your work passes code?**

- (A) The inspector for the AHJ
- (B) The customer
- (C) The supply house
- (D) The apprentice

Original practice questions for study. Not taken from any real exam. Always check the NEC edition used in your area.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

ANSWER KEY WITH EXPLANATIONS

Score each section. 8 of 10 or more: good. Less than that: study the matching page again.

THEORY AND MATH

1 · A I = P / V = 1,800 / 120 = 15 A.

2 · C Ohm's law: I = V / R = 240 / 48 = 5 A.

3 · B Resistance is in ohms. Volts = pressure, amps = current, watts = power.

4 · D (10 x 10) / (10 + 10) = 5 ohms. In series they would be 20 ohms.

5 · C 208 / 1.732 = about 120 V. Phase to phase is 208 V.

6 · A P = V x I. For example, 120 V x 10 A = 1,200 W.

7 · D 20 x 120 = 2,400 W. 1,920 W is the 80% limit for continuous loads.

8 · B 1 / 1.25 = 0.8. A 20 A breaker: 16 A of continuous load.

9 · C I = P / V = 5,760 / 240 = 24 A.

10 · B Drop = I x R = 16 x 0.4 = 6.4 V.

WIRES AND CIRCUITS

11 · D The NEC is NFPA 70. States and cities adopt it, sometimes with changes.

12 · B Every 3 years. Each area adopts its edition on its own schedule.

13 · A Small conductor rule: 14 AWG 15 A, 12 AWG 20 A, 10 AWG 30 A (copper).

14 · C 10 AWG copper: 30 A. 12 AWG: 20 A. 14 AWG: 15 A.

15 · A 14 AWG is thinner than 12 AWG, which is thinner than 10 AWG.

16 · D Neutrals are white or gray. Green or bare is for equipment grounding.

17 · B Green, green with yellow stripes, or bare copper.

18 · C Chapter 9 holds the tables, like conduit fill (Table 1).

19 · A Article 100 is definitions. Grounding is Article 250.

20 · D 40% for over 2 wires. 53% for 1 wire, 31% for 2 wires.

BOXES, GFCI, SPACE

21 · B 14 AWG 2.00, 12 AWG 2.25, 10 AWG 2.50 cubic inches.

22 · D Each device counts 2, based on the largest wire connected to it.

23 · C Up to 4 grounds count as 1, using the largest ground wire.

24 · A 4 wires + 2 (device) + 1 (grounds) = 7. 7 x 2.25 = 15.75 cu. in.

25 · C Bathrooms always. Bedrooms and living areas need AFCI, not GFCI.

26 · B AFCI = arc fault. GFCI is the one that protects people from shock.

27 · D Around 5 mA: small enough to protect a person from a deadly shock.

28 · A 6 ft. That is why receptacles can be up to 12 ft apart.

29 · C 24 in. So counter receptacles can be up to 48 in apart.

30 · B 30 in or the width of the equipment, whichever is greater.

SAFETY AND THE JOB

31 · C Off, lock, tag and test. Labels can be wrong.

32 · A Live-dead-live: it proves the tester worked when it read "dead".

33 · D 70E covers safe work practices and PPE near electrical hazards.

34 · B It is safety training many employers ask for. It is not a license.

35 · D Fiberglass does not conduct electricity like metal does.

36 · A Metal jewelry can complete a circuit and cause serious burns.

37 · C A bigger breaker lets the wire overheat. Find and fix the cause.

38 · B Boards ask for documented experience. Keep it from day one.

39 · D Hours (often about 8,000) plus a passing score on the exam.

40 · A The AHJ (authority having jurisdiction) inspects and approves.

Missed one? Go back to the study pages (11-14) and read that topic again before you retry.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

YOUR 90-DAY CHECKLIST

From zero to your first job or apprenticeship application in about 3 months. Tick each box.

DAYS 1-15 — DECIDE AND PREPARE

- [ ] Read pages 5-8 and pick your route
- [ ] Find your state's licensing board (.gov)
- [ ] Get copies: ID, diploma or GED, transcript
- [ ] Make a simple budget for tools and transport

DAYS 16-30 — BASICS

- [ ] Review algebra 20 min a day
- [ ] Learn the 30 terms on page 10
- [ ] Take the OSHA 10-hour construction course
- [ ] Practice Ohm's law with page 13

DAYS 31-45 — APPLY

- [ ] Apply to 2-3 apprenticeship programs
- [ ] Send your resume to 10 contractors (page 21)
- [ ] Buy safety gear and basic hand tools
- [ ] Follow up on each application after one week

DAYS 46-60 — STUDY

- [ ] Study pages 11-13: NEC and theory
- [ ] Do the practice test until 8/10 per section
- [ ] Practice for the aptitude test: algebra and reading
- [ ] Learn to read a tape measure to 1/16 inch

DAYS 61-75 — FIRST JOB

- [ ] Visit contractors and supply houses in person
- [ ] Register as apprentice or trainee if your state requires it
- [ ] Start a log of your hours on day 1
- [ ] Show up early every day: it is your best reference

DAYS 76-90 — KEEP GOING

- [ ] Ask your lead for one new task each week
- [ ] Keep pay stubs and get your first signed letter
- [ ] Set your next goal: apprenticeship start date or class
- [ ] Review your 90 days and update your resume

Example only. Application windows and waitlists vary. No job or income is guaranteed.

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.

FIRST JOB: HELPER OR APPRENTICE

No experience? Start as a helper or apply to an apprenticeship. Show that you are reliable, safe and ready to learn.

HELPER / APPRENTICE RESUME (FILL IN)

NAME
[Your name] · [City, State] · [Phone] · [Email]

GOAL
Electrical helper / apprentice. Bilingual English-Spanish. Ready to start now.

SKILLS
Hand and power tools · ladder safety · basic math · reading a tape measure · lifting · customer service

EXPERIENCE
[Job] · [Company] · [Dates]: [what you did: construction, maintenance, always on time]

TRAINING
OSHA 10 [year] · [school or online course] · high school diploma or GED

EXTRAS
Valid driver's license · reliable transportation · own basic tools

Keep it to one page and bring printed copies.

WHERE TO LOOK

- Electrical contractors near you: call or stop by early in the morning.
- Supply house counters: contractors buy there every day. Ask who is hiring.
- Apprenticeship programs: union and merit shop, and apprenticeship.gov.
- Your school's job office and your teachers.
- Job sites: "electrical helper", "electrician apprentice", "wire puller".
- Builders, solar installers and facility maintenance companies.

WHAT TO ASK IN THE INTERVIEW

- Pay per hour, and when are raises?
- Will I work next to a journeyman?
- Do you help pay for classes?
- Which tools does the company supply?
- Hours, travel and overtime pay?
- Will you sign letters for my hours?

READY-TO-SEND MESSAGES

Asking for a job

Hi, my name is [Name]. I'm looking for work as an electrical helper. I'm reliable, I have my own basic tools and I speak English and Spanish. Can I stop by to talk?

After applying

Hi [Name], I applied for the helper position on [day]. I'm still very interested and I can start right away. When is a good time to talk?

After the interview

Thank you for your time today, [Name]. I'd love to learn the trade with your team. I can start on [date]. Have a great day!

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.



FROM HELPER TO JOURNEYMAN

One step at a time: get trained, log your hours, study the NEC and keep learning. More free guides for the trades at vifalio.com.

Training → Hours → NEC → License → Grow

Independent guide, not affiliated with any agency, union or school. Pay figures are estimates. Check your state board. No job or income is guaranteed.