



ELECTRICAL FUNDAMENTALS

Electrical Fundamentals youth apprentices gain skills related to the use of construction safety, drawings and blueprints, materials, tools, and electrical worksite procedures. Apprentices must adhere to industry safety and security standards.

Length of Apprenticeship: One or two years

COMPETENCIES

Year 1: Electrical Fundamentals youth apprentices must complete a **total of 15** Electrical Fundamentals Competencies and a **minimum of 1** Electrical Specialty Competency. Employers can substitute **1** competency with another occupationally appropriate skill. That skill should be added to the competency list for assessment. Year 1 competencies are completed with employer guidance. Youth apprentices must also complete the following during the first year:

Youth Apprentices must also complete the following during Year 1:

- First Aid Certification
- OSHA 10 or 30

Year 2: Electrical Fundamentals youth apprentices must complete the fifteen Electrical Fundamentals Competencies with minimal supervision and a minimum of 2 different Electrical Specialty Competency than the first year. A specialty competency may be repeated only if the type of construction (residential or commercial) differs from the first year. Employers can substitute **1** competency with another occupationally appropriate skill. That skill should be added to the competency list for assessment. Year 2 competencies are completed with minimal employer guidance.

Select construction type and circle the applicable year:

- Residential completed during Year: One and/or Two
- Commercial completed during Year: One and/or Two

Note where necessary, skills can be simulated.

Electrical Fundamentals Competencies	Electrical Specialty Competencies
<ol style="list-style-type: none"> 1. Follow safety procedures 2. Read construction drawings and plans 3. Interpret symbols and procedures 4. Contribute to a job task plan 5. Work as a member of a construction team 6. Prepare work area for construction 7. Select construction materials 8. Use hand and light duty tools 9. Use power tools and equipment 10. Perform materials handling 	<ol style="list-style-type: none"> 16. Assist with cutting wire, cable, conduit, and raceway, cording and cutting chasses 17. Assist with pulling wires and attaching wires 18. Assist with connecting conductors to switches, receptacles or appliances 19. Assist with installation of switches, outlet boxes and fixture boxes 20. Assist with installation of feeders and circuits

- | | |
|---|--|
| <ol style="list-style-type: none">11. Install materials per job specifications12. Perform construction measurements13. Maintain a clean and safe work area14. Clean up job site15. Practice quality craftsmanship | |
|---|--|

REGISTERED APPRENTICESHIP BRIDGING OPPORTUNITIES

Some of the related instruction courses can bridge into the following registered apprenticeship:

- Electrical Construction
- Residential Wirer

POST-SECONDARY PATHWAY OPPORTUNITIES

There are several post-secondary pathway opportunities in this area. Following is partial list.

- Construction Electrician
- Residential Electrician



ELECTRICAL FUNDAMENTALS

Youth Apprenticeship ON-THE-JOB LEARNING PERFORMANCE STANDARDS GUIDE

YOUTH APPRENTICE INFORMATION

Youth Apprentice Name	
YA Coordinator	YA Consortium
School District	High School Graduation Date

REQUIREMENTS

Requirements

Youth Apprentices must complete ALL the items listed below. Check completed areas.

- Competency checklist
- Employability Skills checklist (in this job book) or the DPI Employability Skills Certificate
- Related instruction equal to 1 high school credit or at least 3 college credits
- Minimum of 450 work hours

HOURS

Record the hours the youth apprentice worked.

Total Hours Employed	Company Name	Telephone Number

COMPETENCIES

Year 1: Electrical Fundamentals youth apprentices must complete a **total of 15** Electrical Fundamentals Competencies and a **minimum of 1** Electrical Specialty Competency. Employers can substitute **1** competency with another occupationally appropriate skill. That skill should be added to the competency list for assessment. Year 1 competencies are completed with employer guidance. Youth apprentices must also complete the following during the first year:

Youth Apprentices must also complete the following during Year 1:

- First Aid Certification
- OSHA 10 or 30

Year 2: Electrical Fundamentals youth apprentices must complete the fifteen Electrical Fundamentals Competencies with minimal supervision and a minimum of 2 different Electrical Specialty Competency than the first year. A specialty competency may be repeated only if the type of construction (residential or commercial) differs from the first year. Employers can substitute **1** competency with another occupationally appropriate skill. That skill should be added to the competency list for assessment. Year 2 competencies are completed with minimal employer guidance.

Select construction type and circle the applicable year:

- Residential completed during Year: One and/or Two
- Commercial completed during Year: One and/or Two

Note where necessary, skills can be simulated.

Rating Scale

- 3: Exceeds entry level criteria | Requires minimal supervision | Consistently displays this behavior
- 2: Meets entry level criteria | Requires some supervision | Often displays this behavior
- 1: Needs improvement | Requires much assistance and supervision | Rarely displays this behavior

Electrical Fundamentals Competencies	Electrical Specialty Competencies
<ol style="list-style-type: none"> 1. Follow safety procedures 2. Read construction drawings and plans 3. Interpret symbols and procedures 4. Contribute to a job task plan 5. Work as a member of a construction team 6. Prepare work area for construction 7. Select construction materials 8. Use hand and light duty tools 9. Use power tools and equipment 10. Perform materials handling 11. Install materials per job specifications 12. Perform construction measurements 13. Maintain a clean and safe work area 14. Clean up job site 15. Practice quality craftsmanship 	<ol style="list-style-type: none"> 16. Assist with cutting wire, cable, conduit, and raceway, cording and cutting chasses 17. Assist with pulling wires and attaching wires 18. Assist with connecting conductors to switches, receptacles or appliances 19. Assist with installation of switches, outlet boxes and fixture boxes 20. Assist with installation of feeders and circuits

ELECTRICAL FUNDAMENTALS – ALL REQUIRED

- Assess Year 1 competencies completed with supervision
- Assess Year 2 competencies with minimal supervision

Electrical Fundamental Skills	Rating		
Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
1. Follow safety procedures <ul style="list-style-type: none"> • select and use appropriate clothing and personal protective equipment (PPE) • comply with job site safety and security rules and regulations • maintain a clean and organized work environment • identify and report unsafe job conditions • report injuries and damage to property 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Read construction drawings and plans <ul style="list-style-type: none"> • relate drawing to job task • interpret elements and symbols • locate worksite features on a construction plan • convert scales measurements to full measurements • translate specifications to work requirements 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Interpret symbols and procedures <ul style="list-style-type: none"> • explain the role of drawings and specifications • identify drawings and symbols used on a construction drawing • apply information from drawings in construction activities • interpret specifications appearing on construction drawings • interpret and convert measurements in terms of actual dimensions • explain specifications in terms of work requirements 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Contribute to a job task plan <ul style="list-style-type: none"> • setup and prepare tools and equipment for safe operation • determine the scope of work • respect contractual relationships • apply scheduling practices 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Work as a member of a construction team <ul style="list-style-type: none"> • offer and request assistance • follow company policies and procedures • learn from other team members 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Prepare work area for construction <ul style="list-style-type: none"> • remove debris • clean up sites • dispose of waste and hazardous materials 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Select construction materials <ul style="list-style-type: none"> consider usefulness and portability consider minimizing cost consider performance goals 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Use hand and light duty tools <ul style="list-style-type: none"> wear appropriate personal protective equipment (PPE) select the correct tool for the job inspect tool operate the tool safely perform routine maintenance on hand tools store tool 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Use power tools and equipment <ul style="list-style-type: none"> wear appropriate personal protective equipment (PPE) select the correct tool for the job inspect tool operate the tool safely perform routine maintenance on power tools store tool 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Perform materials handling <ul style="list-style-type: none"> identify materials necessary to complete the task conserve resources and materials retrieve equipment and materials needed load and unload materials, tools, equipment, and supplies lift, position, and secure materials during installation 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Install materials per job specifications <ul style="list-style-type: none"> retrieve equipment and materials needed unload materials, tools, equipment, and supplies lift, position, and secure materials during installation 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Perform construction measurements <ul style="list-style-type: none"> select measuring tool read measurement accurately scale proportions convert units of measurement estimate resources, materials, and supplies needed for a project record measurements 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Maintain a clean and safe work area <ul style="list-style-type: none"> clean and maintain materials and tools clean, organize, and put away items in the work area store materials and tools <i>after use</i> follow facility procedures for clean-up and shut down 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. Clean up job site <ul style="list-style-type: none"> • clean and maintain materials and tools • store materials and tools <i>after use</i> • follow facility procedures for clean-up and shut down 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Practice quality craftsmanship <ul style="list-style-type: none"> • inspect and test work to determine quality • monitor throughout for safety and quality • identify impact of building codes on quality of work • verify work meets job expectation 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competency Substitute (if you replaced a competency above, note the competency and rating)	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Comments:			

ELECTRICAL SPECIALTY SKILLS

- Year 1: Select 1
- Year 2: Select 1 different specialty skills or type of construction (residential vs. commercial) identified by employer

Electrical Specialty Skills	Rating		
Competency and Rating Criteria	Minimum Rating of 2 for EACH Check Rating		
	1	2	3
16. Assist with cutting wire, cable, conduit, and raceway, cording and cutting chases <ul style="list-style-type: none"> • select the proper raceway of cable for the conditions • select the proper raceway size, depending on the conductors to be installed • size outlet(s), pull, and junction boxes 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Assist with pulling wires and attaching wires <ul style="list-style-type: none"> • assist with writing • connect wires to circuit breakers, transformers, and/or other components 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Assist with connecting conductors to switches, receptacles or appliances <ul style="list-style-type: none"> • assist connecting two- and three-way switches • assist connecting normal and ground fault receptacles • assist connecting appliance reciprocals 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Assist with installation of switches, outlet boxes and fixture boxes <ul style="list-style-type: none"> • identify and install the various types of electrical boxes • install electrical components according to duplex and Ground Fault circuit Interrupter (GFCI) receptacles, boxes, covers, lamps, wire, solderless connectors, and conduit accurately • use color coding for electrical installations 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Assist with installation of feeders and circuits <ul style="list-style-type: none"> • select the correct feeder size, type, and overcurrent protection for the application • layout electrical systems using materials and devices labeled and listed for project(s) • rough-in and secure cables or conduits for branch circuits • connect circuits to circuit breaker panels • compute the appropriate load calculations and power requirements for the job • follow all grounding and bonding requirements 	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competency Substitute (if you replaced a competency above, note the competency and rating)	Year 1 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Year 2 Rating		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>