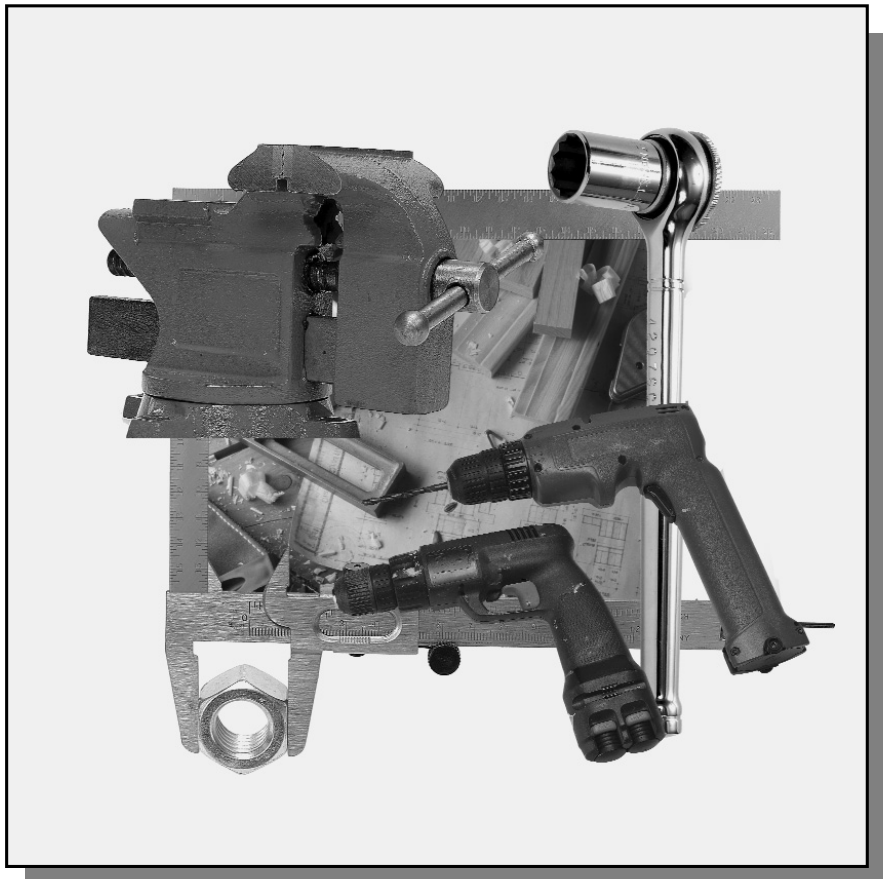
Character and Skills for Home and Careers

Activities



Chapter 4

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Character and Skills for Home and Careers

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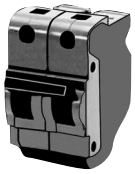
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Chapter 4, Section 1

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Electrical

ACTIVITIES
Lesson 1

A New Job

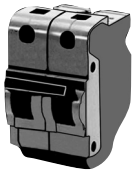
You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Edward and his dad worked for _____ Electric Company.
2. Mr. Estrada had worked for the same company for ten years. _____
   (a) True or (b) False
3. Samuel Estrada was a ***licensed*** _____.
4. An _____ electrician program is _____ years in duration.
5. The classroom hours could be received through ***self-study*** only. _____
   (a) True or (b) False
6. If a builder or electrician were working on a house where people lived, the job type would be called _____.
7. ***Commercial***-type jobs refer to those dealing with: _____.
   (a) houses where people live
   (b) businesses buying/selling goods and services
   (c) factory production/sale of goods and services
   (d) road and bridge construction
8. An apprentice electrician is one who: _____.
   (a) works under the direction of a higher level electrician
   (b) learns a trade by himself, then acquires "hands-on" training
   (c) completes 5 years of public school beyond high school
   (d) only studies the trade in books; no "hands on" training
9. Edward's family consists only of his dad and a younger _____; because his _____ died six years ago.
10. In this lesson, we learned that an electrician must also learn much about plumbing during an apprenticeship. _____ (a) True or (b) False
11. List the three levels of electrician knowledge and ability presented in this lesson in order from the least to the most experience.
    (a) _____ (b) _____ (c) _____
12. At the time of this story, a journeyman electrician could earn _____ dollars per hour.

13. An apprentice and a journeyman electrician earn the same wages. _____
(a) True or (b) False

14. After Mr. Estrada and Edward left for work, Mario went back into the house and took the day off from school. _____ (a) True or (b) False

15. Write the **Life Principle**: *"*_____
_____
_____*."*



Electrical

ACTIVITIES
Lesson 2

The First Day's Travel

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. In the first sentence of lesson 2, the word ***"log"*** refers to: _____.
   (a) a large piece of wood
   (b) a stoppage such as a back log
   (c) a record of day-to-day activities
   (d) a new piece of electrical equipment

2. Most electric company customers do not understand much about electricity, but just want to flip a switch and have _____.

3. When a person enters a dark room and reaches for a light switch to turn on the light, he is acting _____.

4. Electricity is logical and sequential, and is therefore _____.

5. The flow of electricity can be compared to the flow of water. _____
   (a) True or (b) False

6. An electrical switch interrupts the flow of current in a circuit _____.
   (a) True or (b) False

7. Edward was instructed to learn the principles and terms of electricity and how they _____ together.

8. Electricity is created by: _____.
   (a) motors (b) air (c) generators (d) metallic elements

9. From the local _____, electricity is provided to buildings.

10. The _____ makes electricity accessible to the home.

11. The two electrical standards used are _____ and _____.

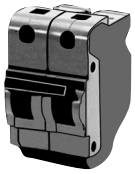
12. The ***NEC*** and ***UL*** were established to: _____.
    (a) protect electricians (c) test electronic devices
    (b) establish government programs (d) protect customers

13. Edward was eager to learn more about: _____.
    (a) safety (c) employee benefit
    (b) technical (d) education and training issues.

14. The phrase, "the time had come to punch his time card" indicates that Edward: _____.

(a) used his fist to hit a card
(b) inserted his time card into a machine that noted the time of day
(c) used a hole puncher to put holes in his card
(d) continued his conversation instead of going to work

15. Write the **Life Principle**: *"*_____
_____
_____.*"*



Electrical

ACTIVITIES
Lesson 3

Practice Safety

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Edward wanted to know more about electrical _____.
2. Mr. Estrada tried to frighten Edward about the dangers of electricity. _____
   (a) True or (b) False
3. Openings created in the electrical current flow are called _____.
4. The size of the ***circuit breakers*** in the service drop is _____ amps, or _____ amps.
5. Smaller circuit breakers control current to individual _____ or to _____.
6. The purpose of circuit breakers is to keep an electrical malfunction from causing a(n): _____.
   (a) noise (b) shock (c) fire (d) injury
7. ***Electrocute*** means to: _____
   (a) supply electricity to a circuit
   (b) make electricity from a generator
   (c) give or receive a fatal or injurious shock from electricity
   (d) break an electrical current
8. The primary sources of electrical safety are _____ created in the flow of electricity.
9. When a ***circuit breaker*** "trips," it: _____.
   (a) breaks or shuts off the flow of current in the circuit
   (b) falls over something
   (c) automatically resets itself
   (d) malfunctions and causes a fire
10. List three things that can cause a circuit breaker to trip or a ***fuse*** to blow.
    (a) _____
    (b) _____
    (c) _____

11. A blown fuse or tripped circuit breaker should be reset repeatedly._____
(a) True or (b) False

12. Electrical current flow through a person's body can _____ regular heart beat and _____ breathing impulses from the brain.

13. Place an "X" in front of the best methods to save someone from electrical shock.
____(a) Knock the person off the wire with a non-conductor item.
____(b) Shut off the electrical current at the main breaker.
____(c) Use a wet rope to drag the person to safety.
____(d) Hold someone else's hand while you grab the victim and pull hard.

14. After electrical shock, _____ should be given to the victim who appears not to be breathing.
(a) food (b) water (c) CPR (d) medicine

15. Cardio-Pulmonary Resuscitation (CPR) is administered to revive _____ and _____ functions.

16. The **ABCs** of ***CPR*** have to do with checking an unconscious/unresponsive person's:
A_____, **B**_____ and **C**_____.

17. Place an "X" in front of all tests you could use to determine if a person is breathing.
____(a) Feel for exhaled air. (c)____ Check the person's pulse.
____(b) Listen for exhaled air. (d)____ Watch for up and down chest movement.

18. Airways in unconscious persons are most often obstructed by the _____.

19. Which is the proper procedure for clearing a victim's air passage? _____
(a) Lift chin, tilt head back (c) Check the person's pulse
(b) Push down chin, tilt head forward (d) Watch for up and down chest movement

20. The best place to check for a pulse is at the ***carotid*** artery in the neck. _____
(a) True or (b) False

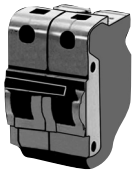
21. To administer chest compressions for cardio resuscitation: _____
(a) place hands, one on top of the other on sternum
(b) fingers are interlocked, elbows locked
(c) cycle 15 compressions with 2 breaths till pulse resumes
(d) all of these
(e) only a and c

22. Write the **Life Principle**: *"*_____
_____
_____.*"*

Name: _____ *Character and Skills for Home and Careers*

Chapter 4, Section 1

Date: _____ Grade: _____



Electrical

ACTIVITIES
Lesson 4

Strapping on the Tools

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The term 'gofer' refers a person who looks like a rodent. _____
   (a) True or (b) False
2. Mr Estrada purchased Edward's _____and _____.
3. Edward realized he needed to learn the _____ of the trade.
4. An electrician's apron is made of heavy duty: _____.
   (a) plastic (b) leather (c) canvas cloth (d) flexible metal
5. The wire ***crimper/stripper*** tool is used to _____, _____ and _____ wire.
6. _____ pliers are used to cut thick wire and to make sharp crimps.
7. Two types of pliers used to do fine work in tight places are _____ and _____ pliers.
8. The difference between flat head and phillips-type screwdrivers is their: _____.
   (a) length
   (b) material composition
   (c) head construction
   (d) handles
9. Mr. Estrada thought an electrician's _____ was probably his most important tool.
10. The clamp-on ammeter is designed to test amperage or electrical _____ and _____.
11. Edward would use _____ to measure resistance in circuits.
    (a) chain nose pliers
    (b) an echometer
    (c) a computer
    (d) a clamp-on ammeter

12. Edward was nervous about possibly making a mistake on his new job. _____
(a) True or (b) False

13. Apprentices are placed with experienced electricians to: _____.
(a) make them nervous
(b) drive the truck and be gofers
(c) make sure the apprentice does not do something dangerous
(d) be sure the electrician is not lonely

14. Label each item.



(a) _____



(d) _____



(b) _____



(e) _____

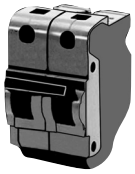


(c) _____



(f) _____

15. Write the **Life Principle**: *"*_____
_____
_____*."*



Electrical

ACTIVITIES
Lesson 5

Wiring Basics

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Mr. Estrada explained to Edward that Mr. Estrada did not know where any of the wiring went and that someone else would have to teach Edward. _____
   (a) True or (b) False

2. The electrical ***schematic*** of the house was used to: _____.
   (a) find the location of the house
   (b) estimate the amount of material for the job
   (c) scheme against the homeowner
   (d) find the homeowner

3. The two most common types of wires are _____ and _____.

4. Wire is sized by: _____.
   (a) inches (b) feet (c) gauge (d) length

5. The most popular electrical wire size for residential wiring is number _____ gauge.

6. The black wire is always: _____.
   (a) 'hot' (b) 'cold' (c) neutral (d) negative

7. In an electrical circuit, the ***"hot"*** wire and the ***"positive"*** wire are not always the same.
   _____ (a) True or (b) False

8. A 240-volt circuit has both a _____ and a _____ colored wire which act as positive wires.

9. The _____ wire is the neutral wire.

10. _____, _____ and bare _____ wires are usually *neutral* or *ground* wires.

11. ***Ground wires*** are so named because they must run along the ground to be neutral. _____
    (a) True or (b) False

12. When wiring electricity, a person can always depend on the color of the wire to identify "hot" and "neutral" wires and does not need to take any other safety precautions.
    _____ (a) True or (b) False

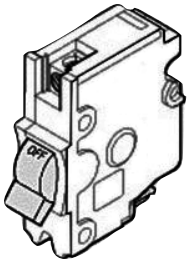
13. To protect yourself from shock, you should always: _____.
    (a) touch the wire with the back of your hand
    (b) check to see if the circuit is "open" by using a voltage tester
    (c) disregard the color of the wires
    (d) turn loose of the wire quickly if it is "hot"

14. If a circuit is "open," the circuit breaker will be in an "off" position. _____
    (a) True or (b) False

15. The metal most commonly used in electrical wiring is: _____.
    (a) copper (c) lead
    (b) aluminum (d) stainless steel

16. Three wires covered in a plastic ***sheath*** are called: _____.
    (a) BMX conduit (b) romex cable (c) armored wire (d) flexible wire

17. Label the items.

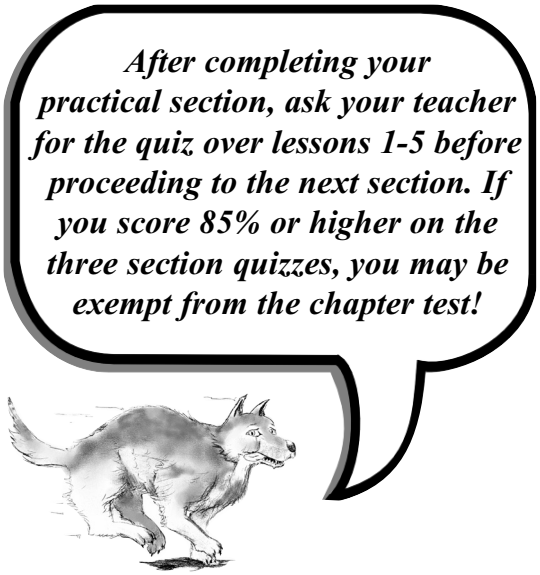




(a) _____ (b) _____

18. Write the **Life Principle**: *"*_____
_____
_____*."*

Continue to the next page for your Hands On Practical Application.



Warning

Students under the age of 18 should not attempt projects described in this course without supervision by a competent adult.

Hands On

These are OPTIONAL PRACTICAL PROJECTS to be conducted under direct supervision of the teacher while manipulating tools and equipment included in this section. (No Answers in Key)

Complete the activities below as indicated.

1. Research how much money electricians are paid locally and list advantages and disadvantages of that career option.

   _____
   _____
   _____
   _____
   _____

2. Why should an electrician start as an apprentice? _____

   _____
   _____
   _____
   _____

3. List at least three different sources of electrical energy.

   a) _____ c) _____

   b) _____

4. List some things you should do if a person has been electrocuted.

   _____
   _____
   _____

5. List and identify the color code used for electrical wiring.

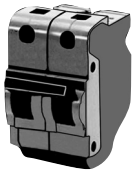
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_____ (Teacher's signature)

Name: _____ *Character and Skills for Home and Careers*

Chapter 4, Section 2

Date: _____ Grade: _____



Electrical

ACTIVITIES
Lesson 6

Finding the Power

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Mr. Estrada used a level string to mark the places where the ***junction boxes*** would be placed. _____ (a) True or (b) False

2. Mr. Estrada decided to use _____ to wire each circuit.
   (a) barbed wire (b) romex cable (c) No. 2 cable (d) high tensile wire,

3. The subpanel was a 100-amp panel. _____ (a) True or (b) False

4. The _____ box was installed according to the ***blue print.***

5. The proper height from the floor to the ***subpanel*** box was: _____.
   (a) 4 foot 6 inches to the top of the box
   (b) 4 foot 6 inches to the center of the box
   (c) 4 foot 6 inches from the corner of the room
   (d) 4 foot 6 inches to the bottom of the box

6. Edward secured the subpanel to the studs with: _____.
   (a) screws (c) clamps
   (b) nails (d) cable ties

7. The size of wire that was to be connected from the service entrance box to the subpanel box was _____ gauge.

8. Mr. Estrada sent Edward to the truck to get heavy gauge _____, _____, _____, and _____ colored wire.

9. Edward used _____ to cut the cable.
   (a) long nosed pliers (c) vise grips
   (b) linesman pliers (d) small bolt cutters

10. The wires were pushed through rigid _____ conduit.

11. Mr. Estrada connected the service cable wires to the service entrance panel first. _____ (a) True or (b) False

12. The wires were connected into the service entrance panel. _____
    (a) True or (b) False

13. Plastic ***outlet boxes*** are the most expensive type of box. _____
(a) True or (b) False

14. Edward and Mr. Estrada used _____ outlet boxes.
(a) plastic (b) metal (c) non metallic (d) paper

15. Label the items.



(a) _____



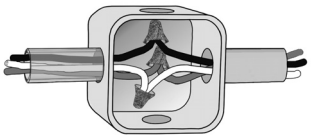
(b) _____



(c) _____



(d) _____



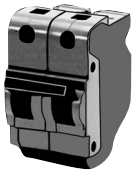
(e) _____

16. Write the **Life Principle**: *"*_____
_____
_____.*"*

Name: _____ *Character and Skills for Home and Careers*

Chapter 4, Section 2

Date: _____ Grade: _____



Electrical

ACTIVITIES
Lesson 7

Box Installation

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Each long wall of the utility room would receive _____ outlet boxes.

2. All together, the building construction plans called for _____ outlet and switch boxes.
   (a) 10 (b) 6 (c) 14 (d) 20

3. The ceiling ***fixture box*** was installed near one of the corners of the garage. _____
   (a) True or (b) False

4. The ceiling fixture box was positioned ½ inch below a 2" x 4" ceiling ***joist*** because:
   _____.
   (a) it was too large to fit otherwise
   (b) it would be easier to connect the light fixture later
   (c) it would allow the Sheetrock to be flush
   (d) it is better if the box is lower

5. Edward was given a small piece of _____ to help set the outlet boxes properly.

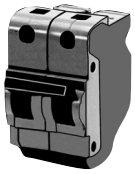
6. The electrical wire used to wire the garage was: _____.
   (a) # 6 gauge stranded (c) # 14 gauge stranded
   (b) # 12 gauge romex (d) barbed wire.

7. The garage was wired for light duty use so more appliances could ***function***.
   _____ (a) True or (b) False

8. The ***switch boxes*** were installed _____ above the floor.
   (a) 2 feet (b) 3 feet (c) 4 feet (d) 1 foot

9. Edward was able to see the product of his _____.

10. Write the **Life Principle**: *"*_____
    _____
    _____.*"*



Electrical

Getting Plugged In

ACTIVITIES
Lesson 8

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Mr. Estrada had a(n) _____ in his pocket.
2. The outlet _____ rating and _____ rating are stamped on the receptacle or on the ***mounting yoke***.
3. A more accurate name for the type of receptacle used in this garage would be: _____.
   (a) an ungrounded, slotted outlet
   (b) a two-slotted, grounded receptacle
   (c) a duplex, grounded, outlet receptacle
   (d) a simple, grounded receptacle
4. The word "duplex" regarding one kind of outlet receptacle indicates that: _____.
   (a) it should be used only in duplex apartments
   (b) it uses two different voltages
   (c) it has two outlets on the receptacle
   (d) it can be easily duplicated
5. The long slots on the left side of the duplex receptacle allow equipment to be: _____.
   (a) grounded
   (b) polarized
   (c) duplex and grounded
   (d) ungrounded
6. The grounded outlet allows soil to enter into the outlet. _____
   (a) True or (b) False
7. The "ground" on the receptacle is there to prevent electrical shock in case of a short in the circuit. _____ (a) True or (b) False
8. _____ colored ***terminals*** go to _____ or black wires.
9. _____ colored terminals go to _____ or white wires.
10. The two types of connectors are _____ wired and _____ wired.
11. The best way to connect any wires to a receptacle is with side-wire terminals. _____
    (a) True or (b) False

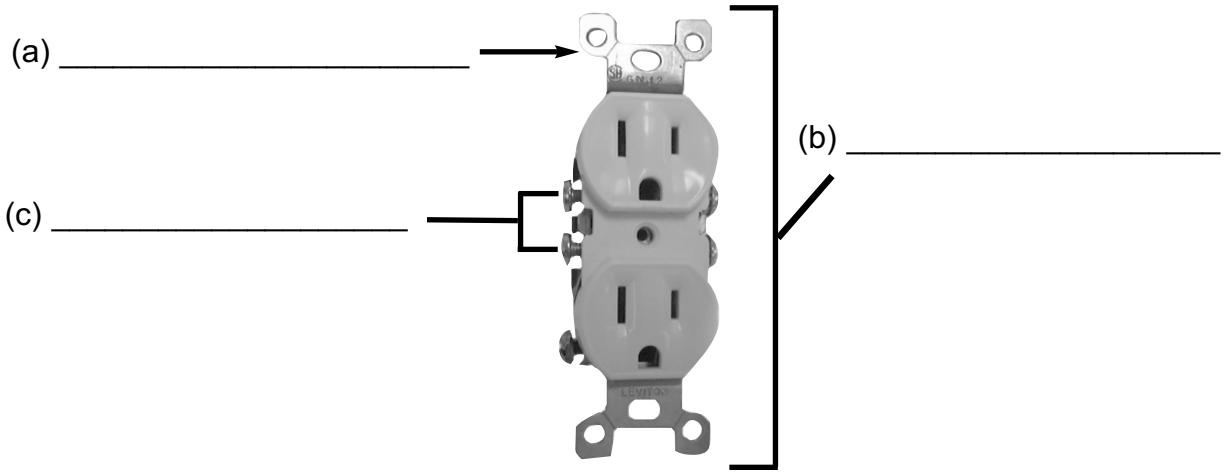
12. The type of receptacle Dealers Electric used was a: _____.
    (a) grounded type with side-wire capabilities
    (b) slotted type with back-wire capabilities
    (c) duplex type with side and back-wire capabilities
    (d) polarized, duplex, grounded receptacle with both side and back-wire capabilities.

13. The purpose of the connecting bar on each side of the receptacle would be:
    _____.
    (a) to connect both outlets together as one circuit
    (b) to hold the receptacle together
    (c) a place to solder wires to the receptacle
    (d) to make installation easier

14. Breaking the connecting bar allows outlets to be wired separately. _____
    (a) True or (b) False

15. More ***versatility*** is gained by: _____.
    (a) connecting the bar
    (b) leaving the bar alone
    (c) breaking the bar
    (d) extending the bar

16. Label the diagram.

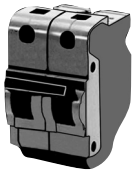


17. Write the **Life Principle**: *"*_____
    _____
    _____.*"*

Name: _____ *Character and Skills for Home and Careers*

Chapter 4, Section 2

Date: _____ Grade: _____



Electrical

ACTIVITIES
Lesson 9

Selecting Switches

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. A switch is always installed on the _____ wire or 'hot' side of a circuit.

2. When the switch is turned off, current continues to flow through the wires. _____
   (a) True or (b) False

3. The most common kind of switch is the: _____.
   (a) double-pole (b) triple-pole (c) single-pole (d) automatic

4. The ***toggle*** of a switch refers to its _____.

5. The switch which provides control at two locations is the _____ switch.

6. Double pole switches are commonly used to switch _____ circuits.

7. Switches must have the _____ approval stamp in order to be accepted.

8. The CO/ARL rating on a switch indicates _____
   _____.

9. A _____ switch adjusts the amount of light provided by a light fixture.
   (a) lights (b) darker (c) white (d) dimmer

10. One type of switch is operated by a key. _____ (a) True or (b) False

11. A time clock switch is used to: _____.
    (a) turn on the time clock
    (b) tell you when to start to work
    (c) turn on the lights when it is time to start to work
    (d) set time for electrical equipment to turn "on" and "off"

12. The ***designations*** of "aluminum" and "aluminum clad" are interchangeable because both terms have the same meaning. _____ (a) True or (b) False

13. Edward recognized the switch with a small light located behind the toggle as a good switch to be used: _____
    (a) in a hallway (b) near stairs (c) in dark places (d) on a porch

Match the name of each item with the picture.

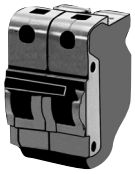
14. _____ dimmer switch (a) 

15. _____ key switch (b) 

16. _____ single pole switch (c) 

17. _____ time delay switch (d) 

18. Write the **Life Principle**: *"*_____
_____
_____*."*



Electrical

ACTIVITIES
Lesson 10

Cutting, Stripping and Splicing Wire

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The initial electrical wiring process is complex and requires complicated tools. _____
   (a) True or (b) False

2. ***Sheathing*** is a: _____.
   (a) place to store wire
   (b) place to store a knife
   (c) covering material for wires
   (d) a place where sheaths are stored

3. Mr. Estrada removed the plastic _____ from the romex cable.

4. Mr. Estrada suggested a _____ as the ideal tool for quickly stripping wire.
   (a) set of vise grips (c) needle nose pliers
   (b) a multi-purpose tool (d) crescent wrench

5. At least _____ inches of wire should be left protruding out of each outlet box for purposes of stripping and splicing.

6. Edward ***stripped*** _____ of ***insulation*** from each wire.
   (a) 1 inch (b) ½ inch (c) 6 inches (d) 3 inches

7. To strip a wire, one would _____ the outer covering of the wire.

8. When speaking of wires, insulation refers to: _____.
   (a) pink fiberglass
   (b) the protective covering of the wire
   (c) complete isolation of the wires
   (d) covering to keep the the wire warm

9. For stripping wires and removing insulation, a pocket knife is the best tool. _____
   (a) True or (b) False

10. Edward prepared the wires properly under the watchful eye of his dad. _____
    (a) True or (b) False

11. Loose wire connections create _____ which, in turn, can create _____.

12. A _____ was used to cover each wire ***splice***.

13. The different sizes of ***plastic connectors*** are determined by _____.

14. An older, experienced person who instructs a younger person is sometimes referred to as a _____.

15. Write the **Life Principle**: *"*_____ _____, _____."

Warning

Students under the age of 18 should not attempt projects described in this course without supervision by a competent adult.

Hands On

These are OPTIONAL PRACTICAL PROJECTS to be conducted under direct supervision of the teacher while manipulating tools and equipment included in this section. (No Answers in Key)

Complete activities as indicated.

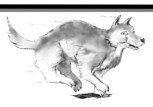
1. Match items with pictures.

____ outlet box	(a)	
____ conduit	(b)	
____ junction box	(c)	
____ tape measure	(d)	
____ bolt cutter	(e)	
____ spade drill bit	(f)	
____ duplex receptacle	(g)	
____ light switch	(h)	

2. ____ Demonstrate the correct method of connecting wires to a duplex receptacle. (Check this item when complete)

_____Teacher Signature

Note: Ask your teacher for the quiz over lessons 6-10 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!





Electrical

ACTIVITIES
Lesson 11

Installing Receptacles

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. The two types of wiring ***methods*** are _____-of-the-run and _____-of-the-run.

2. An outlet box containing two romex cables is a "wired-around connection." _____
   (a) True or (b) False

3. Black wires are always connected to the _____ terminal.
   (a) silver (b) brass (c) green (d) ground

4. White wires are always connected to the _____ terminal.
   (a) silver (b) brass (c) green (d) ground

5. The ground wires in a metal outlet box are: _____.
   (a) left alone (c) pigtailed together
   (b) connected to the ground terminal (d) plugged into an outlet

6. Edward determined that Dealers Electric used the push-in type of outlet _____.

7. The ***perimeter*** of the room refers to: _____.
   (a) the rooms adjacent to a particular room
   (b) the distance from one corner of the room to the other corner
   (c) the distance around the outside walls of a room
   (d) the height of the ceiling in a room

8. Black wires connected to brass colored terminals cause short circuits. _____
   (a) True or (b) False

9. Crossing black wires to silver colored terminals would affect the polarity of the wiring job. _____ (a) True or (b) False

10. A poor connection might cause _____ loss as well as _____ loss and possibly a _____.

11. To check the circuits, Mr. Estrada used a: _____.
    (a) continuity tester (b) voltage tester (c) light bulb (d) bare wire

12. The ***continuity*** tester was powered by _____.

13. A _____ works on the principle of completing a circuit between the ***probe*** and ***alligator clip*** attachments.

14. Write the **Life Principle:** *"*_____
_____
_____*."*



Electrical

ACTIVITIES
Lesson 12

Installing Switches

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Edward did not know what to look for when he was sent to the truck for a single-pole switch. _____ (a) True or (b) False
2. Both black wires would go under the _____ colored switch terminal screws.
3. One of the wires running to the switch would be: _____.
   (a) cold (b) hot (c) green (d) red.
4. The two white wires are _____ together.
5. Edward used the push-in connections on the single-pole switches. _____
   (a) True or (b) False
6. The switch was secured to the _____ by screws in the mounting yoke.
7. A split receptacle can have a socket that is hot all the time and one that is on a _____.
8. The light in the garage was going to be a(n): _____.
   (a) spot light (c) fluorescent light
   (b) incandescent light (d) bare bulb.
9. ***Fluorescent*** lights differ from other lights in several ways:
   (a) Fluorescent lights are _____ shaped.
   (b) Their interiors are coated with _____.
   (c) They contain _____.
   (d) Light is emitted as a result of a chain reaction in which _____ bombard the _____ vapor.
10. In order to have a split _____, the 'hot' ***tab*** on the side between the top and bottom sockets must be _____.
11. If a white wire is used as the "hot" wire, it must be _____ by putting some black tape on it.
12. Write the **Life Principle**: *"*_____
    _____
    _____.*"*



Electrical

ACTIVITIES
Lesson 13

Here Comes the Light

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Edward thought that he and his dad could complete the electrical wiring job in: _____.
   (a) 1 day (b) 1 week (c) 1 month (d) none of these
2. Mr. Estrada was glad to help train an _____, even though it made the work take longer.
3. The fixtures selected were a two-bulb ***incandescent*** fixture and a two-bulb, 40 watt _____ fixture.
4. An electric booster station found inside the fluorescent fixture is a: _____.
   (a) generator (b) transformer (c) ballast (d) bulb
5. Some older fluorescent fixtures contain a _____ and a _____.
6. A watt is a unit of measure that represents a unit of: _____.
   (a) movement (b) current (c) power (d) distance
7. Voltage represents the _____ of electric current.
8. Amperage represents the _____ of electrical current or rate of flow.
9. Mr. Estrada gave Edward three formulas to remember. What were they?
   (a) _____ (b) _____ (c) _____
10. If there were 2400 watts and 10 amps in a circuit, the voltage would be _____.
11. If a 120 volt circuit had 15 amps flowing, the watts would be _____.
12. Write the **Life Principle**: *"*_____*."*



Electrical

ACTIVITIES
Lesson 14

Installing the Lights

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Mr. Estrada used lengths of ***sash chain*** and two_____ to hang the fluorescent fixture so that it would be _____.

2. The fluorescent fixture had to be plugged into the existing _____ receptacle.

3. The light that was going to be placed in the utility room was a: _____.
   (a) fluorescent fixture (c) bare bulb
   (b) 3-way socket (d) 2-bulb incandescent fixture

4. All incandescent fixtures are different internally. _____
   (a) True or (b) False

5. The purpose of a light ***diffuser*** is to: _____.
   (a) capture light from the canopy
   (b) spread light more evenly
   (c) connect the nipple strap with the canopy
   (d) connect the switch and lead wires

6. Use of bulbs of higher wattage than recommended for fixtures can cause: _____.
   (a) less diffusion (b) more diffusion (c) fires (d) blackouts

7. A _____ outlet needed to be added to the garage.

8. All 240-volt receptacles have the same amperage and serve the same purposes. _____
   (a) True or (b) False

9. A receptacle that would accomodate a welder and No. _____ gauge wire were used in wiring the 240-volt receptacle.

10. Edward knew what _____ and _____ would be necessary for wiring the 240-volt receptacle.

11. In a "Y" shaped, 240-volt receptacle, the _____ wire always goes to the bottom of the "Y", and the _____ wires connect to the top of the "Y".

12. Mr. Estrada stated that working on 240-volt wiring should not be any more _____ than working on 120-volt wiring.

13. (Mark with an "X" all that apply.) Contributing factors to the good relationship evident between Edward and his dad would be:
    ____ Dad's patience in dealing with Edward.
    ____ Edward's willingness to learn from his dad.
    ____ Dad's angry, impatient demands.
    ____ Edward's laziness and know-it-all attitude.
    ____ Dad's encouragement and compliments for things his son did correctly.
    ____ Edward's expressions of gratitude to his dad.
    ____ Dad's keeping a record of his son's mistakes and reminding him of his failures.

14. Write the **Life Principle**: *"*_____
    _____
    _____*."*



Electrical

A Job Well Done

ACTIVITIES
Lesson 15

You are making progress! ***Answer the following questions. Circle the correct answers or fill in the blanks with words, letters or numbers as each question indicates. Check your answers from the Answer Key. Correct all errors, then complete your next goal.***

1. Mr. Estrada and Edward finally were ready to: _____.
   (a) hook up the electric current (c) install the subpanel
   (b) install the service panel (d) use #6 gauge wires

2. The _____ wire is connected to the neutral ***bus bar.***

3. The black and red wires are connected to the _____ bus bar.
   (a) cold (b) active (c) neutral (d) hot

4. A "bus-bar" is a(n): _____.
   (a) place where buses go for repairs
   (b) large iron bar used to haul dysfunctional buses to a repair barn
   (c) electrical conductor used to distribute electrical currents
   (d) electrical bar used to charge buses that operate on electricity

5. The green wire is connected to the _____ bus bar.

6. The wires in the subpanel box that run from the building addition totaled: _____.
   (a) 10 (b) 8 (c) 6 (d) 4

7. A grounding ***lug*** is the means by which ground wires are connected to the ground bus bar.
   _____ (a) True or (b) False

8. The black wire from the home circuit was connected to a 20 amp _____
   _____.

9. At the service panel box, the first thing Mr. Estrada did was to turn off the main
   _____.

10. Mr. Estrada and Edward used _____ to check the circuits.

11. Edward was excited that the _____ light actually worked when the switch was flipped.

12. Write the **Life Principle**: *"*_____
    _____,
    _____.*"*

Warning

Students under the age of 18 should not attempt projects described in this course without supervision by a competent adult.

Hands On

These are OPTIONAL PRACTICAL PROJECTS to be conducted under direct supervision of the teacher while manipulating tools and equipment included in this section. (No Answers in Key)

Complete activities as indicated.

1. Where in electrical work would you most likely find a "pig tail"?

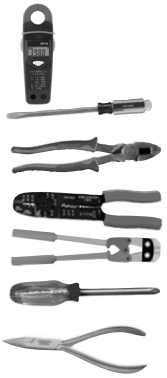
   _____
   _____
   _____
   _____

2. Explain the procedure to change a duplex receptacle into a split receptacle.

   _____
   _____
   _____
   _____

3. Match items with pictures.

   ____ chain nose pliers (a)
   ____ wire stripper (b)
   ____ bolt cutter (c)
   ____ flat screwdriver (d)
   ____ phillips screwdriver (e)
   ____ lineman's pliers (f)
   ____ clamp-on ammeter (g)



4. Would you want to be an electrician? Why or why not?

   _____
   _____
   _____

Note: Ask your teacher for the quiz over lessons 11-15 before proceeding to the next section. Reminder: If you score 85% or higher on the three section quizzes, you may be exempt from the chapter test!

