

MIDDLE
TENNESSEE
FFA
AGRICULTURAL
MECHANICS
SKILLS
CAREER
DEVELOPMENT
EVENTS

Revised 2002

Preface

The intent of these skills is to be a part of the instructional program in Agricultural Education. All skills are part of the State Board of Education approved "Vocational Agricultural Curriculum Framework, 1985." The intent of the FFA Skills contest is to use the competitive events as a motivator for students to perform better. The competitive events also are to serve as a reward for the students that excel in the agricultural mechanics skill areas as a result of the instructional program

During the time span of the Spring of 2001 through August 2002 the District FFA Advisors were directed by the FFA Board of Directors and empowered to act on the revision of the Agricultural Mechanics Skills CDE Events. Mr. Steve Gass, State Supervisor, was the chairman of the directors. Each advisor represented one of the 11 districts in Middle Tennessee. Each advisor was charged to hold meetings with their respective district's advisors for suggestions for improvement and ideas for new events. The committee consisted of the following members:

Steven Gass	State Department	Executive Chairman of Committee
Philip Johnson	Fairview	Dav-Wil District, Chairman
Keith Vanhooser	Cornersville	Blue Grass District
Don Willoughby	Mt. Juliet	Cordell Hull
Mike Akridge	White House	Parks District
Tim Mackey	White County	Highland Rim District
Tommy Beavers	Moore County	Crimson Clover District
Brian Perry	Lewis County	Muscle Shoals District
Tom Strother	East Robertson	Red River District
Bruce Haley	Eagleville	Mid State District
Randy Garrett	Pickett County	Upper Cumberland District
Barry Elliot	Stewart County	Lower Cumberland District

Studies were made and at each meeting results were given of the research. The advisory board compiled all suggestions and made the necessary changes to clarify the regulations for the events. Tool Identification was added to the skills and is for 9th or 10th grade members. If a 9th grade member places 1st in the Regional competition, they will not be eligible to compete in the same event the following year. This goes along with any Regional 1st Place winner in Regional Competition not being able to compete in the same event the following year. (example: 1st in arc welding 11th grade, cannot compete in arc welding their senior year)

During the 2002-2003 year all advisors are asked to compile short answer questions for all of the CDE Events. We will be adding a short answer written exam for Small Engine CDE in 2002-2003 school year. Exams will follow for all of the other events to reinforce reading, writing, and math skills for the Gateway and TCAP Exams that are required by the State Department.

The host chapter must be notified in advance of special needs for any contestant involved in a CDE. This will allow the host chapter to make arrangements to secure an individual to assist the member. (example: reading handicap)

Safety Glasses must be OSHA Approved and have side protection shields. *Prescription glasses will not be sufficient for safety glasses.*

A district that sends a single chapter to represent their district to the Regional Ag Mechanics Competition instead of individual winners from each event is to bring 3 advisors from that respected district to help in judging the Regional Competition. This will help solve the judge shortage that will occur in this instance.

The Middle Tennessee FFA Agricultural Mechanics Skills CDE Rules and Regulations may be found posted on the FFA Website. www.k12.tn.us/ffa

Regulations

1. Only active FFA members (now enrolled in Ag Ed) will be eligible to compete.
2. An FFA member may participate in only one skill.
3. The district winner in each of the skills will participate in the regional contest. In case the first place winner cannot participate, the second place winner will be used. The advisor of the second place student will be notified by the advisor of the first place winner when necessary.
4. Each contestant must remain in the area designed for his skill until he is released by the person in charge of the skill.
5. No one may coach or give assistance to contestants. Judges may disqualify a contestant when assistance has been given.
6. Ag Ed teachers will serve as judges in the regional contest. Districts will be responsible for procuring their own judges.
7. The judge will rank the contestants through fifth place in each skill.
8. Points toward the Awards Trophy will be allowed as follows:

	1 st	2 nd	3 rd	4 th	5 th	Others
District (Team)	15	13	11	9	7	5
Regional (Individual)	5	4	3	2	1	1
9. Contestants must provide all tools and supplies needed for their respective skills except that which is designated as materials furnished at site of contest.
10. A certain maximum amount of time will be allotted to each skill. No additional time will be given a contestant for being late. A notification will be given at end of time for each skill and all work must stop immediately. Unfinished products will be judged.
11. A winner of a skill in the regional contest will not be allowed to participate in the same skill in following contests.
12. Each contestant must register prior to the contest in his/her skill and no substitutes or additions will be allowed after registration. Note: These regulations are to be used in the District Skill Contests.
13. All contestants must wear safety glasses that are ***OSHA Approved and have side protection*** during competition and at all times that they are in the contest area except for students competing in land measuring and land elevation. Prescription Glasses will not be sufficient for safety glasses.
14. The contestant will be disqualified for the removal of safety glasses except when cleaning the lens.
15. The host chapter is to be notified in advance of special needs for any contestant involved in a CDE. This will allow the host chapter to make arrangements to secure an individual to assist the member. (example: reading handicap)
16. In the event that a district were to send a single chapter from that respected district to the Regional competition, they are to bring at least three advisors from that district to help in judging the CDEs. This will help eliminate the shortage of advisors that will occur when only one chapter comes from a single district.

Laying Block

Materials to furnished at site of contest:

1. Rating Sheets
2. Hose
3. Water
4. Tar paper or suitable area covering (if desired)
5. Three corner blocks and three stretcher blocks

Materials to be furnished by contestant

1. Mortar boards
2. Pails (if needed)
3. Wheel barrow
4. Hoe
5. Soapstone
6. Square-nosed, short-handled shovel
7. Enough Sand for laying 6 blocks
8. Enough Hydrated Lime for laying 6 blocks
9. One trowel
10. One level
11. One "S" jointer
12. One six-foot folding ruler
13. One carrying bag (if desired)
14. One pencil
15. One framing Square
16. One Brush or Burlap Sack to clean blocks
17. Safety Glasses must be worn while performing task or the contestant will be disqualified. Exception is only when cleaning the lens of their safety glasses.

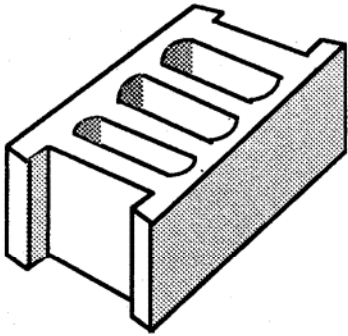
Procedure for student doing skill:

1. Mix Sand and Dehydrated Lime "on site" for the block laying exercise.
2. Square corner on concrete shop floor, driveway, or other existing suitable hard surface. (covered with tar paper if desired)
3. Lay a corner masonry unit using three 8" x 8" x 16" corner blocks and three 8" x 8" x 16" stretcher blocks. (two- or three-core blocks may be used)
4. Joint the blocks.
5. Clean the blocks with the use of a brush or burlap bag.

Procedure for judging:

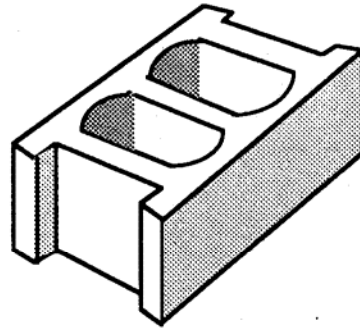
1. Judges will be present to observe the proceeding of the entire contest.
2. Observe the thickness of the mud mixture.
3. Observe the correctness of design, neatness, speed, block and tool manipulation.
4. Observe the correctness of height, level, plum, square, uniform joints.
5. Contestants will be allowed one hour to complete the exercise.

Information Sheet

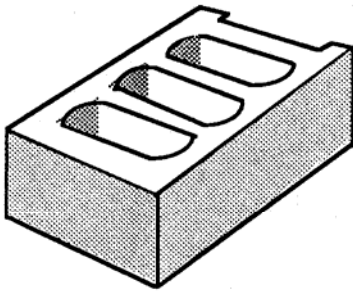


3-CORE STRETCHER BLOCK**

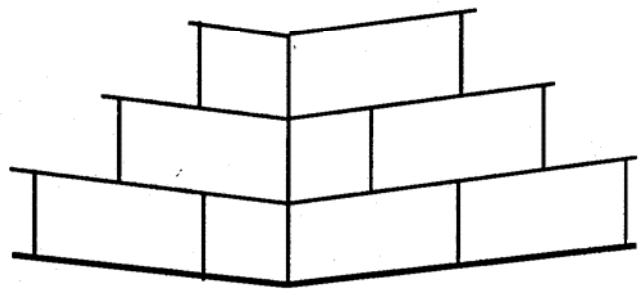
** The actual measurement of an 8 x 8 x 16 inch block is 7 5/8 x 7 5/8 x 15 5/8 inches. If the block is laid with a 3/8 inch mortar joint, the height area will be 8 inches and the length area 16 inches.



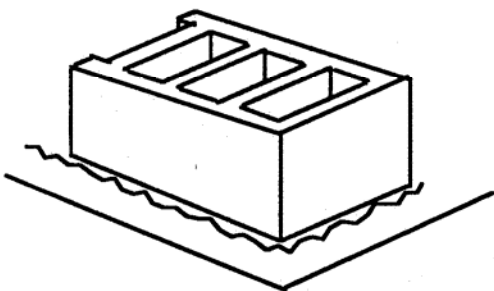
2-CORE STRETCHER BLOCK**



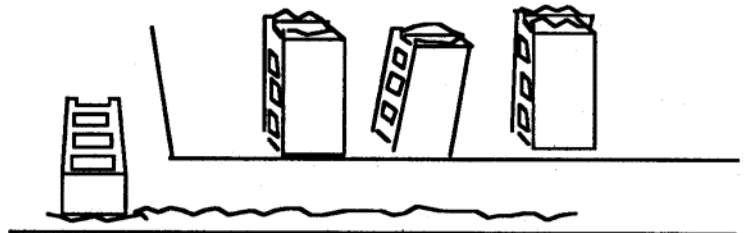
CORNER BLOCK **



CORNER BLOCK EXERCISE



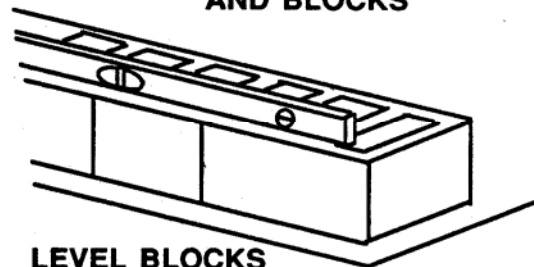
LAY CORNER BLOCK



APPLY MORTAR TO FOUNDATION AND BLOCKS



ALIGNING FIRST COURSE



LEVEL BLOCKS

Refer to Vocational Instructional Services
Texas A & M College Station, Texas
V-E-1 Basic V.A. IV for an excellent unit on masonry

Rafter Cutting

Materials to be furnished at site of contest:

1. Two 2" x 4" x 8' (square edge)
2. Plates provided at proper distance (determined by judge)
3. Nails

Procedure for students in doing skill:

1. Layout and make pair of rafters including:
 - Upper Plumb Cut
 - Bird's Mouth
 - Horizontal Projection (overhang).
2. Contestants will measure Span set up by Judge(s).
3. Judge(s) will give contestants the following specifications:
 - Rise per Foot of Run
 - Horizontal Projection (overhang)
4. Bird's Mouth is to be 2" from top line of rafters, measured perpendicular from the top of the rafter.
5. Safety Glasses must be worn while performing task or the contestant will be disqualified. Exception is only when cleaning the lens of safety glasses.
6. Saw Rafters using tools from the lists below.
7. Nail pair of rafters together at Upper Plumb Cut. Then nail to the plates.
8. Contestant may get another contestant in Rafter Construction to hold rafters while nailing.
9. Power tools that may be used are as follows:
 - Circular Saw
 - Jigsaw
 - Reciprocating Saw
 - Miter Box Saw
10. Hand tools that may be used are as follows:
 - Handsaw
 - Rule or Tape Measure
 - Calculator
 - Framing Square
 - Saw Horse(s)
 - Clamp
11. Maximum time allowed for skill is One (1) Hour.

Procedure for Judging:

1. Observe length and cuts.
2. Observe erected pair of rafters as to fit at:
 - Upper Plumb Cut
 - Ridge
 - Bird's Mouth
3. Observe the rise.
4. Observe as to horizontal projection (overhang) and lower plumb cut.

FITTING A BOARD

Eligibility:

The skill is for enrolled first-year Agriculture Education students. If a Junior High and a Senior High FFA Chapter both exist for a school, and since the Senior High is ineligible to participate, the Senior High Chapter will receive the points earned by the Junior High Chapter.

Materials to be furnished at site of contest:

1. Host chapter shall furnish a 2" x 6" x 24" board with uneven ends.
2. All Contestants shall be given the same kind and quality of wood.

Tools allowed for procedure:

1. No tools allowed except for:
 - handsaw (*no miter or backsaw*)
 - square
 - rule or tape measure
 - pencil
 - saw horse
 - clamp

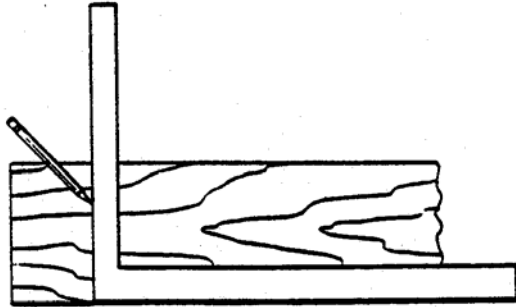
Procedure for student in doing the skill:

1. Cut board to length determined by judge.
2. Only one cut may be made on each end.
3. The clamp may be used to hold board steady.
4. *No jig of any type may be used.*
5. Time limit shall be thirty (30) minutes.
6. *Safety Glasses must be worn while performing task or contestant will be disqualified. Exception is only when cleaning lens of glasses.*

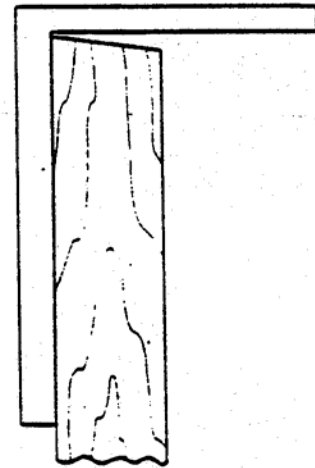
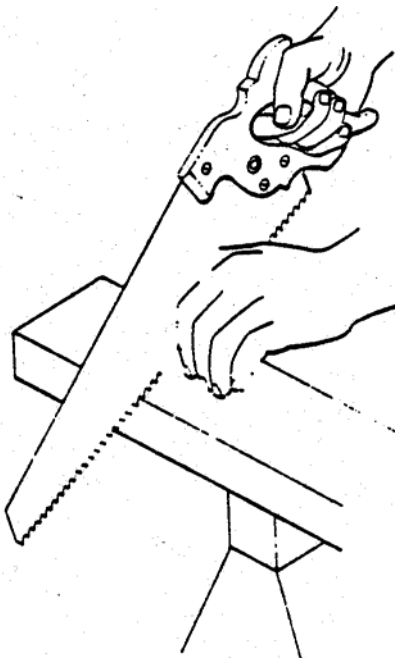
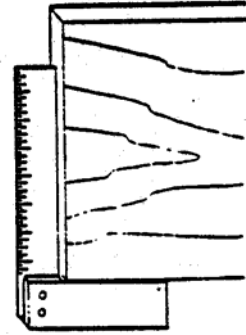
Procedure for judging:

- | | |
|-------------------------------|--------------------------------|
| 1. Length | 40 points |
| 2. Horizontal Squareness (6") | 20 points (10 points each end) |
| 3. Vertical Squareness (2") | 20 points (10 points each end) |
| 4. Correct use of tools | 20 points |

Fitting A Board Exercise



Measuring and marking



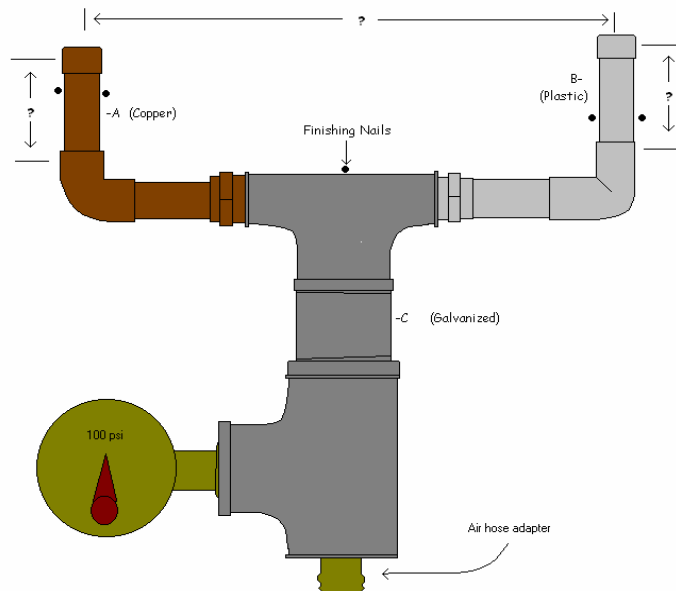
Checking for squareness

PLUMBING

(Revised 11/16/2002 by Crimson Clover District)

Procedure for Skill:

1. Contestant will measure template board once and record the distance *center to center* of nails for the upright position of the copper and plastic pipe. (*D*)
2. Galvanized tee *shall be centered* between the copper and plastic pipes on the template and upright copper and plastic pipe will lay between the nails contestant measured. (*copper pipe on left and plastic pipe on right*)
3. Cut all pipe to required lengths.
4. Prepare pipe: ream, thread, clean, and apply cement, lead-free solder, Teflon tape, or joint compound.
5. Assemble according to exercise plan.
 - a. Galvanized pipe leave 1 to 1 ½ threads showing when finished.
 - b. Plastic and Copper adapters tighten until a secure joint is achieved.
 - c. Use Teflon tape or joint compound on all fittings going into the galvanized tee.
6. Lengths of pipes A, B, and C (*measurement E*) are the same (*minimum of 10 inches long*) to be *given by the judge*.
7. Contestants will be allowed a maximum of one hour to complete the project.
8. Contestant will be *disqualified for the removal of safety glasses except when cleaning safety glasses lenses*.



Procedure for Judging:

- | | |
|--|-----------|
| 1. Check pipe measurements by using template. | 25 points |
| 2. Check assembly to see if according to plan | 10 points |
| 3. Check general appearance | 15 points |
| 4. Check for water leaks by applying 100 p.s.i. air pressure to fixture while submerging in a bucket of water. | 50 points |

Materials to be provided by host:

1. Template, 1" x 10" x 24", for laying out fitting exercise.
2. Five eight-penny finishing nails for setting

FFA-A national student organization chartered by Congress as an integral part of instruction in Agricultural Education Courses. (Public Law 740)

Revised: 2002

3. Air Hose and source.
4. Shut off valve to attach to fixture.

Template set-up by judge:

1. Judge drive two pairs of eight penny nails into the board and in a straight line from each other at predetermined distance.
2. This predetermined distance shall be 12", or more, apart.
3. The nails for the Copper tubing side shall be ¾" apart
4. The nails for the CPVC tubing shall be ¾" apart. (*this will need to be 1" for PVC pipe.*)

Materials to be furnished by contestant:

1. Galvanized pipe and tools:
 - a. 18" of ½" galvanized pipe
 - b. One ½" galvanized tee
 - c. Pipe joint compound or Teflon tape
 - d. Pipe vise
 - e. Pipe cutter.
 - f. Pipe Threader
 - g. Pipe Reamer
 - h. Pipe Wrench
 - i. File
2. Copper pipe and tools:
 - a. 18" of ½" hard copper tubing
 - b. One ½" copper elbow
 - c. One ½" copper cap
 - d. One ½" copper to galvanized adapter
 - e. Copper tube cutter or hack saw
 - f. Steel wool or emery cloth
 - g. Paste or acid flux for copper sweating
 - h. "Lead Free" solder
 - i. Butane torch or any other source of heat
 - j. Adjustable wrench for adapter
 - k. Clean wiping cloth
3. Plastic pipe and tools:
 - a. 18" of hard CPVC or PVC plastic pipe
 - b. One ½" CPVC/PVC elbow
 - c. One ½" CPVC/PVC cap
 - d. One ½" CPVC/PVC plastic to galvanized to adapter
 - e. Hacksaw or Tubing Cutter
 - f. Sandpaper or emery cloth for dressing cuts
 - g. Plastic pipe cleaner
 - h. Plastic Pipe cement
 - i. Adjustable Wrench

3-way Electric Switch Installation

Person in charge of contest shall determine by lot, which of the three types of 3-way switch is to be constructed:

1. Light between the switches, source of energy at light.
2. Light beyond the switches, source of energy at light.
3. Light beyond the switch, source of energy at switch most distant from light (8" from base).

Minimum materials to be furnished by contestant:

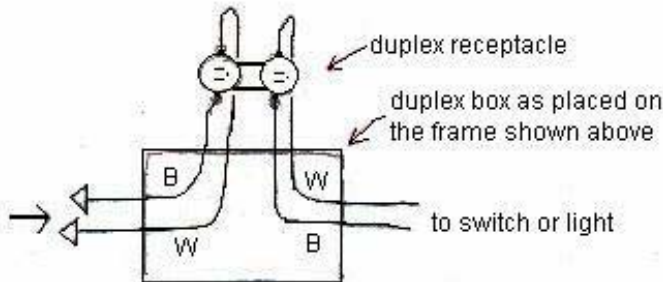
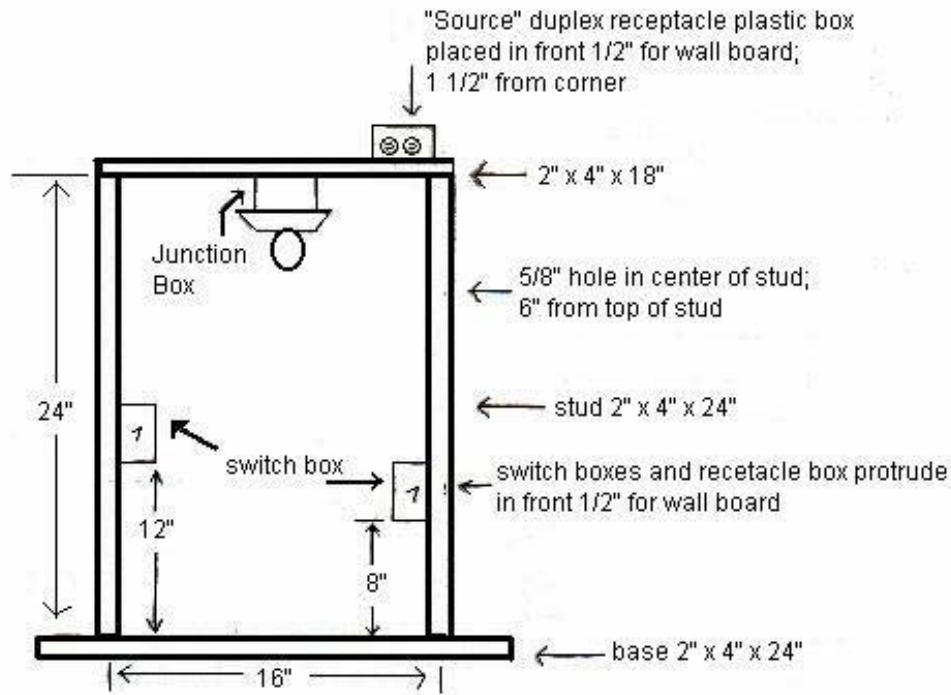
1. Three wall boxes 3" x 2" x 3" or comparable (one metal and two plastic.)
2. Two 3-way switches (at least one with green screw).
3. One duplex receptacle with green screw.
4. One 4" metal ceiling box 4" x 2 1/2" with green grounding screw or clip.
5. One keyless receptacle.
6. 14/3 non-metallic sheathed cable with ground 5 ft. long. (Refer to diagrams on page 25).
7. 12/2 non-metallic sheathed cable with ground 8 ft. long.
8. Sufficient number of solderless connectors to fit above listed wires.
9. Two switch box covers.
10. One duplex receptacle cover.
11. Wood frame according to drawing.
12. Required number of 1/2" non-metallic sheath cable fasteners.

Notes:

1. This skill is designed to teach electric principles rather than carpentry.
2. Contestant will furnish own tools.

Host chapter will furnish an extension cord six feet or more in length with a male plug on both ends to be used by the judge in testing the wiring with current.

**Procedure
for student
in doing
skill:**



ends capped with wire nut
(represents wires to panel for source)

1. Boxes are to be installed before contest begins.
2. Frame must be secured to table with clamp before contest begins. All work must be completed with frame clamped to the table right side up.
3. Run a 12/2 cable with ground from the duplex receptacle box, through the hole drilled into stud, and into the box that is designated for the source wire to enter (either the light or switch box).
4. Install wires in boxes.
5. Connect wires to switches and to receptacles and line.
6. Connect and exit a 12" 12/2 wire from the left side of the duplex receptacle box. Let four to six inches of cable protrude from box, with one to two inches of the sheath covering removed- bare 1/2" of ends of wire and attach solderless connectors on the bared wires to cap them individually. (This is only used to represent the wires that would be coming from the panel box in a real application).

NOTE: The student is not to connect power.

Maximum time allowed each contestant: One hour.