LESSON PLAN HW1 DAY M T W T F Date: '1		
COURSE: TCJ CONSTRUCTION	GRADE: 11	CREDIT YES NO
LESSON TYPE/TOPIC: Introduction to House Wiring		
LESSON EXPECTATION: E.1, demonstrate an understanding of and comply with health and Safety Regulations and practices specific to the construction industry. C.1, demonstrate appropriate technical skills, including the safe use of construction tools, equipment, and materials. E.1.3 use, handle, and store materials in accordance with Workplace Hazardous, Materials Information System, (WHMIS) E.1.5 use protective clothing, gear and equipment appropriately (*e.g. dust mask, safety glasses, safety harness*) C.2.4 implement appropriate solutions for construction problems or challenges.		
MOTIVATION and RECALL (prior learning) By this point in the semester students have learned and built wood frame structures. They are now ready to work within the framing to understand if their comprehension is good enough to consider a regulated trade such as plumbing or wiring.		
TEACHER AIDS CHALKBOARD/HANDOUT/OVERHEAD Video on Volts, Ohms and Amps 8:44 min. http://www.youtube.com/watch?v=zYS9kdS56l8&sns=em Simple circuit design identifying "hot", "neutral" and "ground". Have ready wire for cutting and stripping exercise. Video on tools 3:09 min. http://www.homeadditionplus.com/Electrical%20Articles/Residential-Electrical-Wiring-Tools-Video.htm Using tools shown in video demonstrate activity on preparing wire for installation.	TEACHER POINTS: The Electrical Trade offers many job opportunities including Industrial, Commercial, Residential Electrician, Technician, Installer, Inspector. This is where students have an opportunity to work from a blueprint to construct the wall on which they will do the house wiring project. Define Voltage, Receptacle, outlet and Amperage Purpose of exercise is not to make electricians out of any of them but make them aware of higher safety standards and hazards.	

	ACTIVITY (if applicable) With 6 to 8 inch samples of #14 Romex each student will use utility knife, wire strippers and pliers to remove outer insulation and strip back ¾" on white and black wires. Ground wire should be folded back over remaining wire. Errors can be reused by cutting wire ends shorter.
ASSIGNMENT: Take a look at home tonight and see what the details of house wiring, this is usually the end result. Lights fixtures and so forth.	FOR NEXT CLASS: Have ready: Blueprint of 6' x 6' L-wall for every four students. Be ready to run wire and hook up receptacle and lamp fixture.
	REFLECTION: High academic standards for the Electrical Trade turn off the Special Need Student so emphasizing manual aspects of installation not hook ups will alleviate these concerns. Giving students wire samples early in the lesson gives the student concrete examples of what is being discussed. Keep pieces short to avoid horseplay such as slapping a fellow student.

LESSON PLAN HW2 DAY M T W T F Date: '1

COURSE: TCJ CONSTRUCTION	GRADE: 11	CREDIT YES NO

LESSON TYPE/TOPIC: Placement of House Wiring

LESSON EXPECTATION: E.1, C.1, E.1.3, E.1.5. C.2.4 Refer to HW 1

MOTIVATION and RECALL (prior learning) Discuss what was found at home and define Voltage, Receptacle, outlet and Amperage. Ladders, drills and screw drivers are basic tools needed to work on electrical repairs at home. How many have changed a light bulb? Replaced a plug? Turned off a breaker?

TEACHER AIDS
CHALKBOARD/HANDOUT/OVERHEAD
Wire samples of various gauges and strands are passed around for inspection.
Video on wire 7:10 min
http://www.youtube.com/watch?v=_AApboO3aj0&noredirect=1
Two pieces of wire at 3 m are used by each pair of students to be installed then removed and shortened for classes in next semester. Details on how to drill, strap and connect wires should be demonstrated.
Video on rough in 8:23 min
http://www.youtube.com/watch?v=1vu1EsHA6x4&feature=plcp

TEACHER POINTS:
Discuss what was found and home.
Based on observations at home how would you rank 1. accessibility 2. adequacy (were there enough) 3. What are the lighting fixtures and how are they controlled? 4. Should extension cords be used? Perhaps on a stereo the meter long cord allows the machine to have needed power to operate at its peak.
A built sample of activity is useful.

ACTIVITY (if applicable)
Have ready: Blueprint of 6' x 6' L-wall for every four students. No drilling should take place today but placing electrical boxes.
Calculate the rough-in length of wires and number of straps needed.

ASSIGNMENT:
Students understand they are looking at the plan view of this activity and will add symbols and wire routes for switch, receptacle and lamp.

FOR NEXT CLASS:
Review portable drill safety sheet.
Consider how wire runs can be shortened within the wall and simplified to expedite their installation in industry.

REFLECTION: Students are fascinated by the fine wire used in "ear buds" compared to heavy gauges used in house wire. Do not encourage the cutting of every wire they see to identify gauge but rather suggest internet search of manufacturing web sites and visits to building centers to find the wires used.

LESSON PLAN HW3 DAY M T W T F Date: '1

COURSE: TCJ CONSTRUCTION	GRADE: 11	CREDIT YES NO

LESSON TYPE/TOPIC: Introduction to House Wiring

LESSON EXPECTATION: E.1, C.1, E.1.3, E.1.5. C.2.4
Working within their built frames drill holes for and run wire.

MOTIVATION and RECALL (prior learning) By this point in the semester students have learned and built wood frame structures. They are now ready to work within the framing to understand if their comprehension is good enough to consider a regulated trade such as plumbing or wiring.

TEACHER AIDS
CHALKBOARD/HANDOUT/OVERHEAD
This is where students have an opportunity to work from a blueprint to work on the wall which they will do the house wiring project.

Video on receptacle hookup 6:01 min
http://www.youtube.com/watch?v=1-BZnAlPJOQ&feature=plcp

TEACHER POINTS:
Box locations need to be measured whereas drill hole locations need not be measured but may be based on comfort of position while using the drill.
Drill may "kick back" so care should be taken to slow drill when getting near end of hole.
Strapping can damage wire so be accurate when placing and check to keep wire free as you hammer strap tight.

ACTIVITY (if applicable)
Mark location of switch 51" from floor to top, box 15" from floor to top and octagon box 16" down from top plate. Drill holes and run wire within frame wall and to boxes. Bare and strip wire folding back into box as practice for possible jobsite practice.

ASSIGNMENT:
Research three-way switch wiring and describe through text and images how #12 Romex differs from the wire we use in class, #14 Romex.

FOR NEXT CLASS: Prepare for testing by reviewing possible hazards.

LESSON PLAN HW4 DAY M T W T F Date: '1		
COURSE: TCJ CONSTRUCTION	GRADE: 11	CREDIT YES NO
LESSON TYPE/TOPIC: Introduction to House Wiring		
LESSON EXPECTATION: E.1, C.1, E.1.3, E.1.5. C.2.4		
MOTIVATION and RECALL (prior learning) By this point in the project students have built a wood frame wall. Practiced stripping and joining #14 house wire. They are now ready to work within the framing to understand if their comprehension is good enough to consider a regulated trade such as plumbing or wiring		

TEACHER AIDS	TEACHER POINTS:
CHALKBOARD/HANDOUT/OVERHEAD Instruction sheet on testing process. 1. Are wires securely fixed to wall 2. Are wires on fixtures tight 3. Are fixtures snug to box 4. Has power cord been properly attached Troubleshooting tips regarding tripping of power bar include removal of fixture and inspecting for blackened connections, loose wires, and wires touching metal box. Retesting to take place only after close inspection of all elements.	This is the most crucial point of the project where no licensed electrician is on site. A wire feed line of at least a meter in length is attached to the switch location on student pair's, This feed line has a plug end that can be inserted into a commercially purchased power bar or better find an unused one your school provides. The power bars are equipped with a breaker mechanism that reacts to high voltage thus the power is off whenever a student's work causes a short or incomplete circuit. Once fixtures, strapping and wire are removed walls with boxes can be used for drywall exercise.

	ACTIVITY (if applicable) Students will ask for an inspection before attaching power supply cord. Power goes to switch box only. Provide a report on test that includes length and condition of wire and fixtures.
ASSIGNMENT: Once tested, the fixtures and wires are removed. Wires can be cut back for use next semester and stored in an appropriate place. Cut off bits of wire should be stripped with insulation being disposed of while bare wire can be placed in recycling bin.	FOR NEXT CLASS: Next step in the curriculum will be floor framing so students that live in wood or metal framed buildings may be able to study floor framing up close and report to those that are on high rise condos ore apartments.
	REFLECTION: Working on a practical wiring assignment has allowed students to, "see behind the walls" as far as house wiring is concerned. The test allows the opportunity for every type of individual to succeed as theory is as important as practical application in the regulated trades.