



ELECTRICAL TRADE SAMPLER

NORKAM

5 WEEK PROGRAM



ERIC NIELSEN

- *EARNED MY RED SEAL IN 2015*
- *BEEN WITH TRU SINCE 2018*
- *WORKED IN MOSTLY INDUSTRIAL / COMMERCIAL*
- *ALSO HAVE A RED SEAL IN CARPENTRY*

TODAY'S SCHEDULE

WHO

Class introductions.

WHY

Look at the apprenticeship model.

WHAT/ WHEN

Go over the course outline together.

WHERE

Information about TRU and student perks.

HOW

Get set up with Moodle and more.

SAMPLER

INTRODUCE YOURSELF

- *What is your name?*
- *What do you do for fun? (Sports, music, hobbies, etc.)*
- *Which trade, if any, have been most interesting to you so far?*



YOUR APPRENTICESHIP – G2

- ✓ **Training - 80/20 Structure**
- ✓ **Different Paths Available**
- ✓ **Incentives and Credits**
- ✓ **Mentoring**
- ✓ **Well Rounded Education**
- ✓ **Questions**



Training - 80/20 Structure

- *80% on the job / 20% in the class*
- *40 weeks working / 10 weeks in class*
- *1500 working hours / 300 school hours*
- *6000-hour apprenticeship / Interprovincial Red Seal Exam*

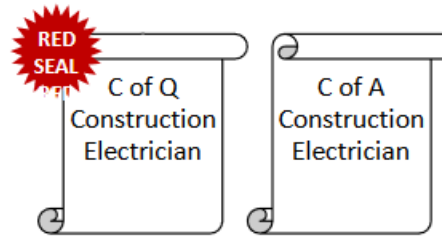


Different Paths Available

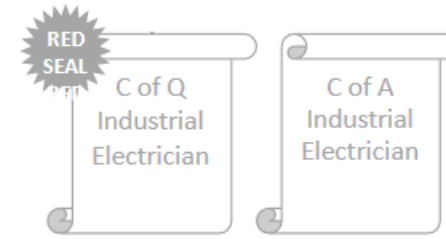
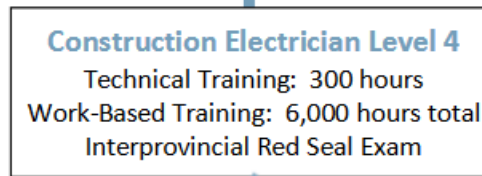
- *Two fields in the Electrical trade*
 - *Construction Electrician*
 - *Industrial Electrician*
- *School is the same in Years 1-3*
- *Industrial requires experience Log*
- *School 10 Weeks Long (each year)*
- *Both fields require 6000 Hours to write Red Seal*

Construction Electrician

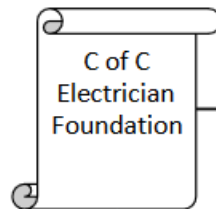
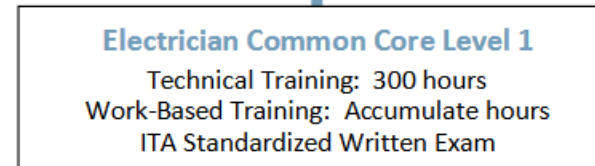
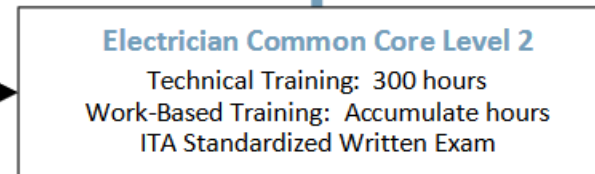
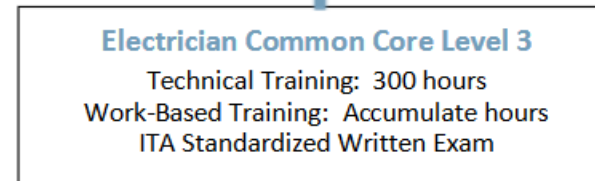
C of Q = Certificate of Qualification
C of A = Certificate of Apprenticeship
C of C = Certificate of Completion
WBT = Work-Based Training



RECOMMENDATION FOR CERTIFICATION



RECOMMENDATION FOR CERTIFICATION



CREDIT

Technical Training: Level 1
WBT: 350 hours

Electrician Foundation Technical Training:
720 hours



Incentives and Credits

- *Completion tax credit: \$2,000 for completion of 3rd year / \$2,500 for 4th year*
- *Apprenticeship completion grant: \$2,000 for completion of the red seal apprenticeship program*
- *More financial supports offered at www.workbc.ca*



Mentoring

- *Apprenticeship model:*
 - *I do, we do, you do*
- *Apprenticeship ratios:*
 - *Residential (120/240V – Single phase)*
1 Journeyperson : 4 Apprentices
 - *Commercial / Industrial (Everything else)*
1 Journeyperson : 2 Apprentices



Questions

- *What are your questions regarding an apprenticeship in the trades?*
- *How many of you have made your mind up to pursue an apprenticeship?*
- *How many of you have decided to pursue a different path?*

COURSE OUTLINE

Instructor: Eric Nielsen
Office: TT 260

Phone: (250)377-6094
E-mail: enielsen@tru.ca

Calendar Description: Electrician Apprentice Level 1 (EEL 2000)

Course Description: First-Year Electrical Apprenticeship Theory.

Educational Objectives/Outcomes: Interprovincial Red Seal certificate at the end of four-year Apprenticeship

Prerequisites:

- Skill Trades BC ID number

Texts/Materials:

- Current version of the Canadian Electrical Code (CEC) book
- ITA Electrician Apprenticeship Program *Harmonized* Binders 1 & 2
- TRU 1st year lab package
- Basic Scientific Calculator (Sharp EL520WBBK is recommended)
- Notepad or lined paper to take class notes
- CSA-approved safety glasses

Instructional Hours

- 8:30 am - 9:40 am (classroom)
- 9:40 am – 10:00 am (coffee)
- 10:00 am - 11:50 am (classroom)
- 11:50 am - 12:30 pm (lunch)
- 12:30 pm - 2:30 pm (classroom)
- Office Hours (upon request)

VIDEO

Thompson Rivers University. (October 3, 2024)

TRU campus tour 2024 – Thompson Rivers University. YouTube.

<https://www.youtube.com/watch?v=6jc9QVVUC8Q>

HOW TO LOG INTO MOODLE

First time login for computers / MYTRU:

Username: T00123456

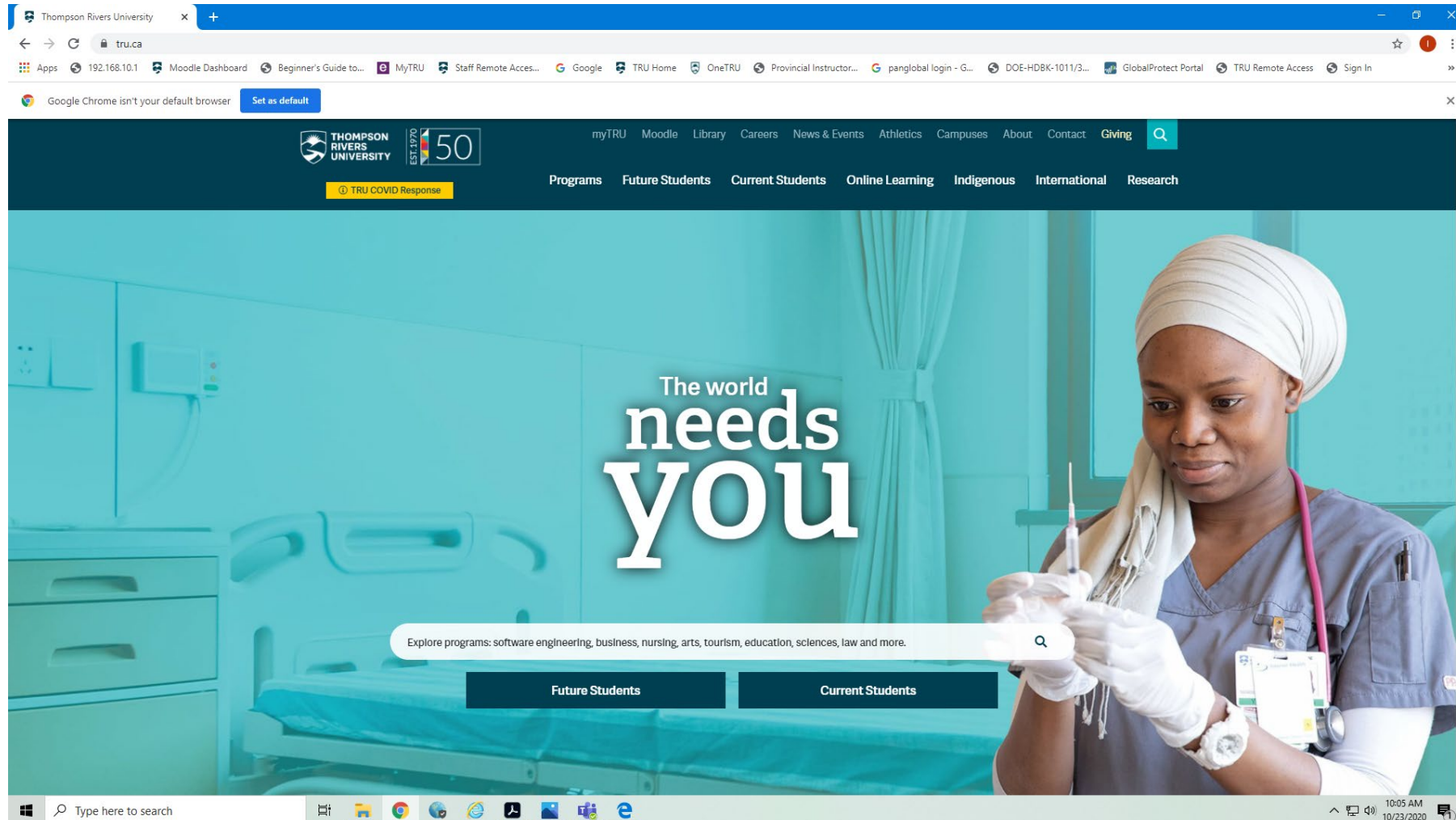
Password: TRU25dec19

Minimum password standards for TRU systems:

Use a minimum of 8 characters and a combination of CAPITAL LETTERS, lower case letters, and numbers.
Do not use any part of your name, TRU ID or birthdate.

HOW TO LOG INTO MOODLE

1. go to tru.ca
2. click on the Moodle tab.



CONTACT INFO



Eric Nielsen



enielsen@tru.ca



(250)377-6094

Safety

Shop Safety

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Shop Safety

Personal Protective Equipment

VIDEO

Ally Safety. (October 26, 2022)

Don't be a Jimmy. YouTube.

<https://www.youtube.com/watch?v=wCcKsjbv3fA>

VIDEO

Ally Safety. (June 16, 2021)

PPE safety video. YouTube.

https://www.youtube.com/watch?v=nw_pNMnLG3A



Clothing

You must wear:

- Full length pants.
- Shirt with (at least) short sleeves.
- Steel toe boots.
- Safety glasses.

Footwear

We need steel toe boots in the shop everyday.

They must be CSA approved.



Eye protection



TRU

- ▶ We need safety glasses in the shop area, at all times.
- ▶ They must be CSA approved.
- ▶ Tinted ones will be too dark for in the shop
- ▶ If you wear glasses, they must be CSA rated with approved side shields, or...
- ▶ Safety glasses overtop of your prescription glasses



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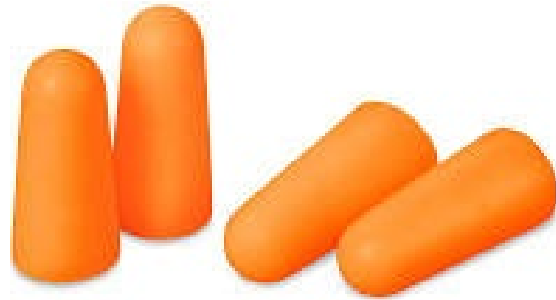


Eye protection

► Normally safety glasses are all we need, but if you need to use a chop saw, grinder, or drill press you'll need to sign out a face shield from the tool crib.

Hearing protection

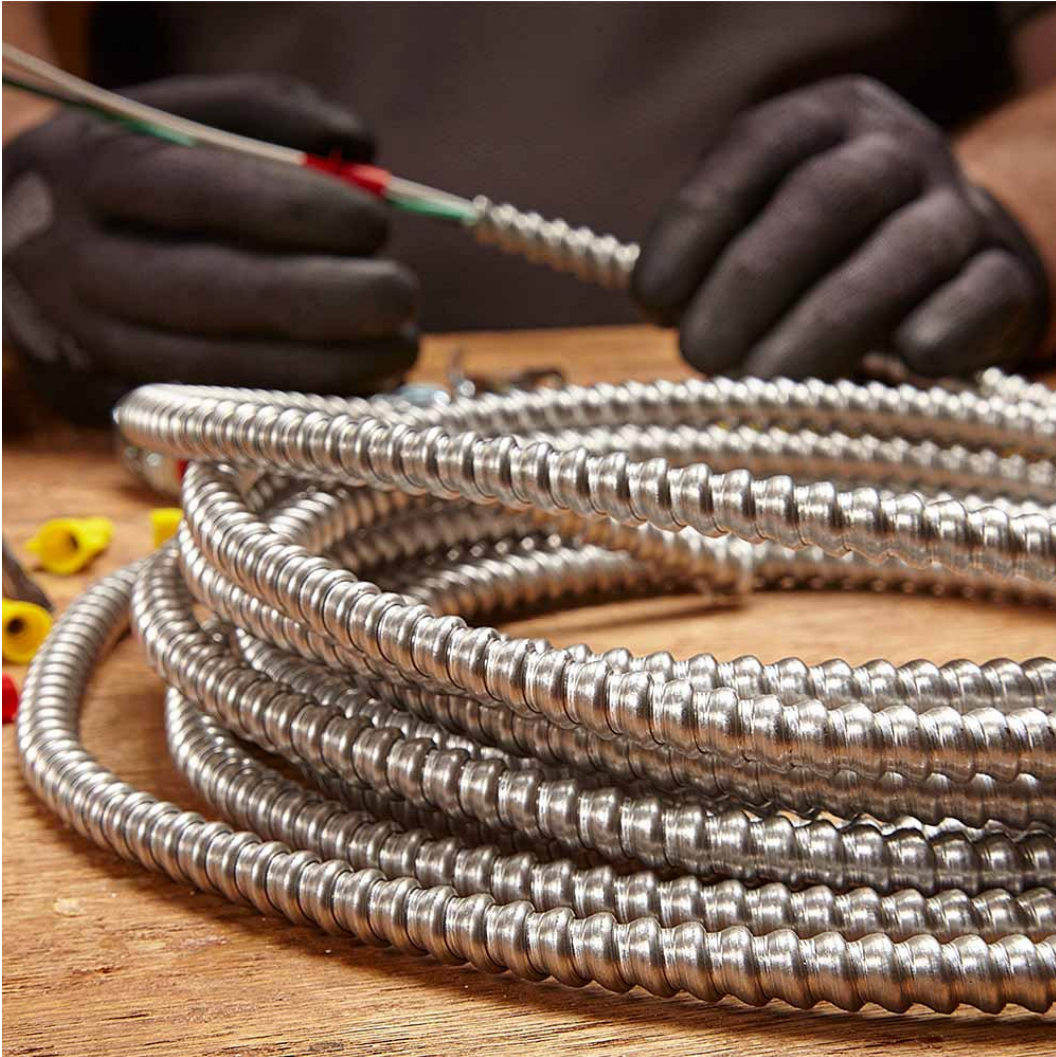
Good



Better



Hand protection



TRU



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Head protection

Types of adjustments.



Lung protection



Half mask respirator



Full mask respirator



Disposable mask

Power tools

► You will probably need to use a variety of power tools in the shop.

► Do not use any power tool you are not familiar with prior to permission and instruction from your instructor.

Shop Safety

Ladders

VIDEO

Safety Time. (2016)

Ladder Safety. YouTube.

https://www.youtube.com/watch?v=gDI6_k6UPwo

Ladders - Extension



An extension ladder is designed to lean against a wall or structure.



The ladder should be placed at the correct angle, so it won't slip out, or tip over.



A 4 to 1 ratio gives the correct angle. For every 4 feet up, the ladder should be 1 foot out from the wall.

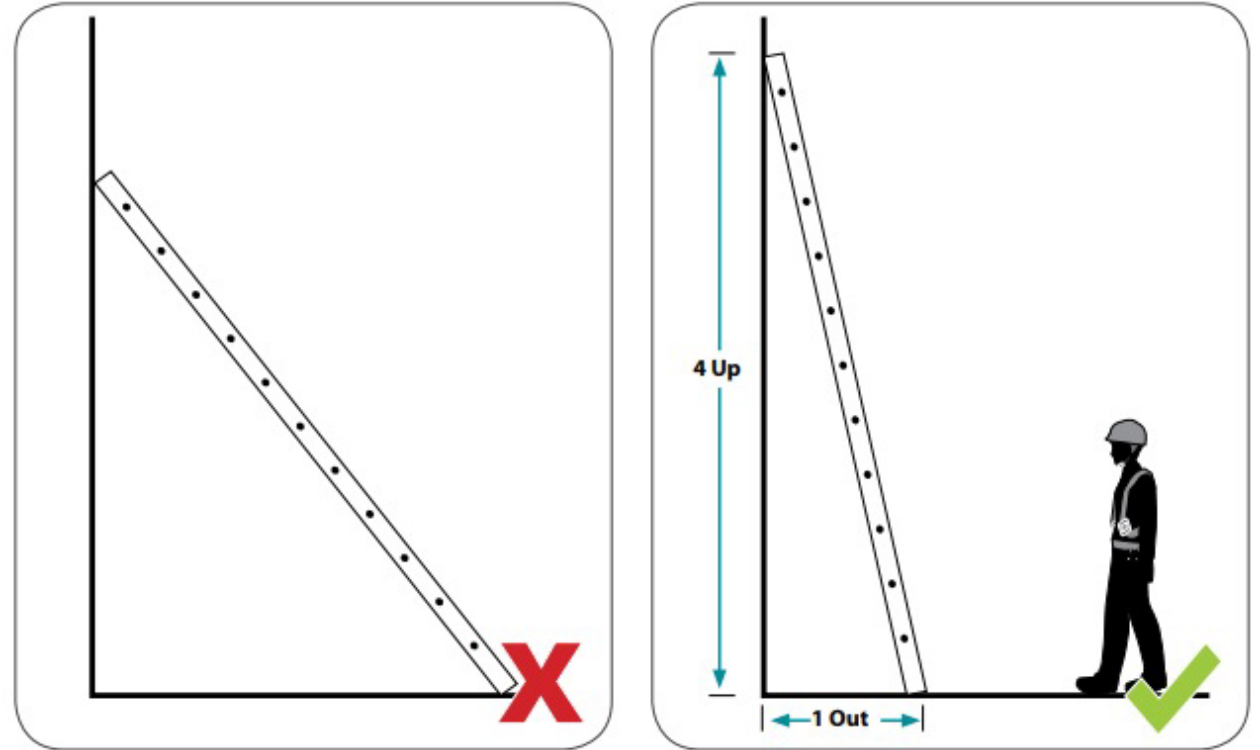


Figure 11.4: The ratio of the height to the base for a correctly positioned ladder is 4:1.

$$\frac{12 \text{ Ft up}}{4} = 3 \text{ ft. out}$$

Ladders - Stepladder

For stepladders ensure:

- The spreaders are fully extended
- All legs are firmly planed on a level solid surface
- Do not stand above the second to top step



Ladders - Types

Ladders are made of one of three materials:

- ▶ Aluminum ladders are dangerous around electricity because they conduct electricity. We just don't use them!
- ▶ Wooden ladders are not conductive to electricity, but they can rot when exposed to moist conditions over time.
- ▶ Fiberglass ladders offer the best choice for both for long life and safety from electrical conductivity. The drawback is that fiberglass ladders are also the most expensive.

Ladders - Types



Step Ladders

Height | Reach

6ft | 10ft

8ft | 12ft

10ft | 14ft



Multi-position Ladders

Height | Reach

17ft | 18ft

21ft | 22ft

25ft | 26ft



Extension Ladders

Height | Reach

16ft | 15ft

24ft | 23ft

28ft | 27ft



Platform Ladders

Height | Reach

8ft | 12ft

10ft | 14ft

12ft | 16ft

Shop Safety

Procedures and Equipment

VIDEO

Ally Safety. (May 6, 2021)

PREVENTING SLIPS, TRIPS, AND FALLS / Safety video & Toolbox Talk. YouTube.

<https://www.youtube.com/watch?v=yZNdZoLI5uM>



Good Housekeeping

- Work areas should be well-lit, burnt-out lighting should be fixed asap.
- Extra task specific lighting can be added for odd spaces.
- Keep floors and work areas clean and dry. Clean as you go.
- Keep ladders in good condition. Any ladders that aren't in good condition should be taken out of service.
- Put your waste products into properly labelled containers.

Shop safety equipment

- ▶ Emergency shutoffs (panic buttons)
- ▶ Fire control systems
- ▶ Emergency exits and meeting place
- ▶ Eye wash facilities
- ▶ First aid facilities



Electrical emergency shutoff

- ▶ In the shop we have emergency electrical shutoff buttons
- ▶ They will shut down the power to all our workstations
- ▶ Use them if you need to

Fire control systems

In the shops and hallways we have fire extinguishers.

Each area is required to have a pull station that will set off the fire alarm and call the fire department.

Use them if you need to.



Emergency exits and meeting place

If the fire alarm does go off, use the nearest exit.

For our classroom and shop that will mean exiting towards the campus and meeting in the traffic circle roundabout.





Eyewash station

- ▶ There's an eyewash station across the hall from our shop in the plumber's shop
- ▶ Use it if you need to

Shop Safety

Lockout



Lockout procedure - Shop

- ▶ Whenever we are doing work, we will lock out the source of energy to make it safe.
- ▶ Use only a keyed lock (not combination).
- ▶ Use only your own lock.
- ▶ Only ever remove your own lock.
- ▶ Use a 'scissor clip' so that more than one person can lock-out if needed.
- ▶ Label your lock with your name and phone number

Lockout procedure

You'll be provided with a scissor clip and lock.

I'll go over our specific lockout procedure with you in the shop.



VIDEO

Ally Safety. (November 11, 2020)

Lockout Tagout | An introduction to the control of hazardous energy. YouTube.

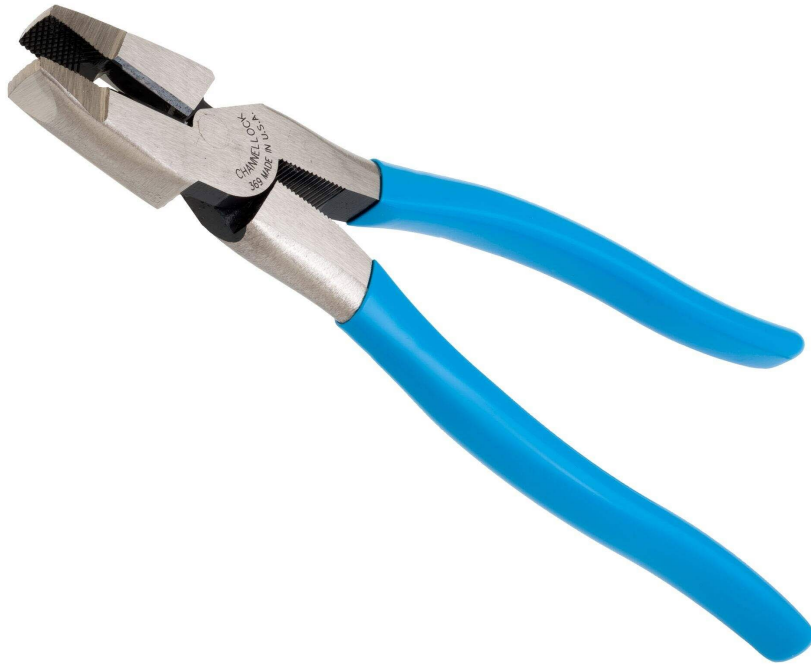
<https://www.youtube.com/watch?v=o5CWnUFsevo>

Shop Tools

Basic Electrical Hand Tools

Electrician's Tools

Linesman Pliers



Side Cutters



Electrician's Tools

Wire Strippers



Needle Nose Pliers



Electrician's Tools

Tape Measure



Knife



Electrician's Tools

Slip Joint Pliers



Torpedo Level



Electrician's Tools

Screwdrivers



Hacksaw



FOUNDATION REQUIRED TOOLS

E.B. Horseman & Son

Guillevin International CO.

EECOL Electric

Wesco Distribution Canada

Westburne Electric Supply

KMS Tools

Required Tools

Students need to purchase a Klein, Ideal, Greenlee or Milwaukee starter tool/pouch kit which comes with 8 to 10 of the items listed below. Items not included in the starter kit must be purchased separately. All tools listed below are required for the program.

- 1 - Tool Pouch
- 1 - Belt for Tool Pouch
- 1 - Hacksaw with 5 - 12" blades (32 Teeth per Inch)
- 1 - 5M or 16 foot (3/4") Tape Measure
- 1 - Electrician's Knife (small curved blade)
- 1 - Flat Blade Screwdriver (shank and handle length approx 9", blade width is 3/16")
- 1 - Flat Blade Heavy Duty Screwdriver (shank and handle length approx 11", blade width is 5/16")
- 1 - Robertson #2 Screwdriver (total length 8" to 10" – usually Red)
- 1 - Robertson #1 Screwdriver (total length 8" to 10" – usually Green)
- 1 - Set of Slip Joint Pliers (approx. 10" in length)
- 1 - High Leverage Linesman's Pliers with insulated comfort grips (approx. 9" in length)
- 1 - High Leverage Diagonal-cutting Pliers with insulated comfort grips (approx. 8" in length)
- 1 - Wire Stripper-Cutters (strips wire up to #10 AWG)
- 1 - Needle Nose Pliers (approx. 8" in total length)
- 1 - Phillips #2 Screwdriver (total length approx. 8 to 10")
- 1 - 16 oz Hammer (Hammer Holder if required, Tool pouch may come with one)
- 1 - 9 inch Torpedo Level (magnetic)

ADD FOR NEXT TIME:

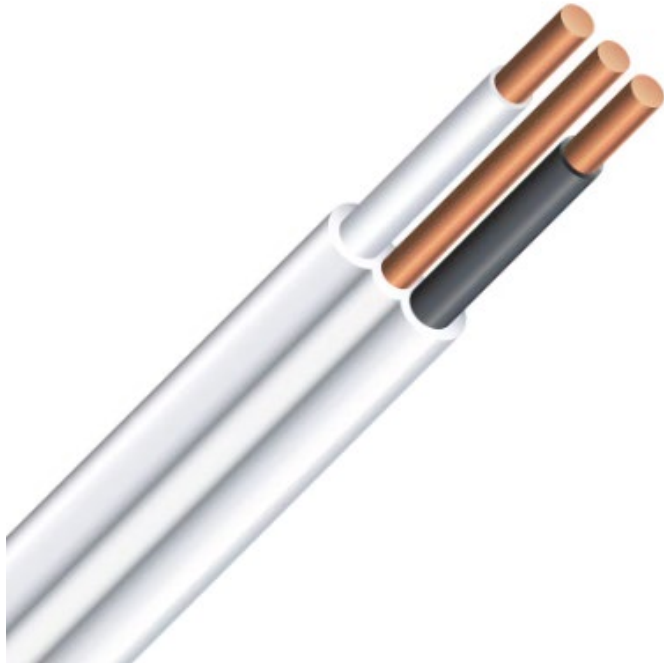
- **Plug Tester**
- **OLFA or Box Cutter**
- **10 in 1?**

Shop Materials

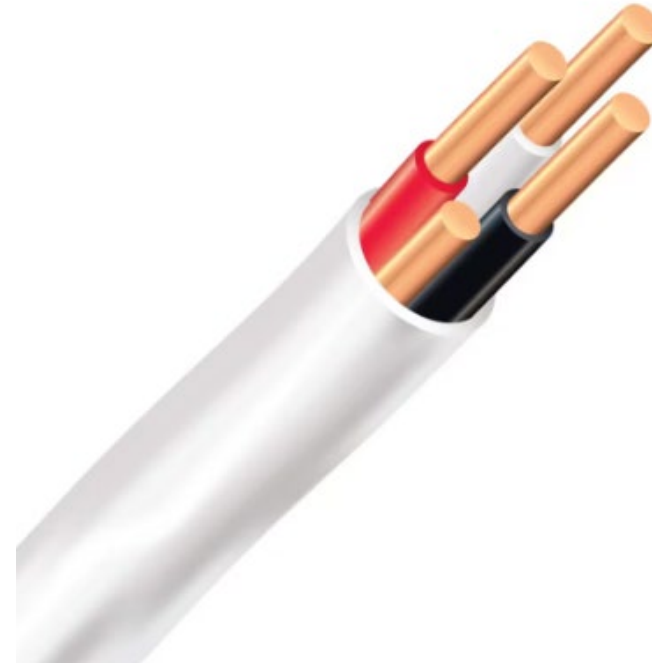
Basic Electrical Materials

Common Materials

Loomex (14/2 wire)



Loomex (14/3 wire)



Common Materials

Boxes



Connectors



Common Materials

EMT



Single Conductor Wire (X link)



SHOP VIDEO – DAY 1

Engineering Mindset. (August 30, 2019)

*How receptacles work – The basic working principle explained
grounding. YouTube.*

https://www.youtube.com/watch?v=eTGkvddOtFc&list=PLWv9VM947MKjuqlJVp5m_Edf66SrFSHx2&index=7