Junior Achievement
JA TRADES

Electrical Training

Junior Achievement™ USA

Member of JA Worldwide

What is JA Trades?

- Junior Achievement of Greater St. Louis offers a program called JA Trades, designed to introduce middle and high school students to careers in the trades. This hands-on program emphasizes the value of STEM skills and provides real-world experiences across a variety of trade professions.

- Students rotate through different stations to gain practical insight into careers such as welders, electricians, carpenters, and more.

- Volunteers play a vital role in the success of this program. We appreciate your support and hope your experience is both rewarding and memorable.

Why teach Trades?

- High Demand: Skilled workers are needed more than ever as many retire.
- Career Path: Trades offer a solid, well-paying alternative to college.
- Hands-On Learning: Ideal for students who prefer practical, real-world skills.
- Strong Earnings: Many trade jobs offer great pay and benefits.
- Essential Roles: Trades are critical to keeping our communities running.

Volunteer Role

- Students will rotate through several trade stations to gain first-hand experience with different skilled careers. Your role is to lead a simulation that teaches students how electricity travels from a power plant to your home. You'll introduce the activity, guide them through the steps, and help them understand how this model is used in Trades.

Electricity

Electricity is made at a power plant and sent through high voltage power lines. It goes through stations and transformers to lower the voltage and make it safe and ready to use. It then travels through smaller lines into your house to power things like lights and TVs.

Industries that use Electricians

- Construction
- Manufacturing
- Healthcare
- Telecommunications
- Transportation
- Energy
- Entertainment

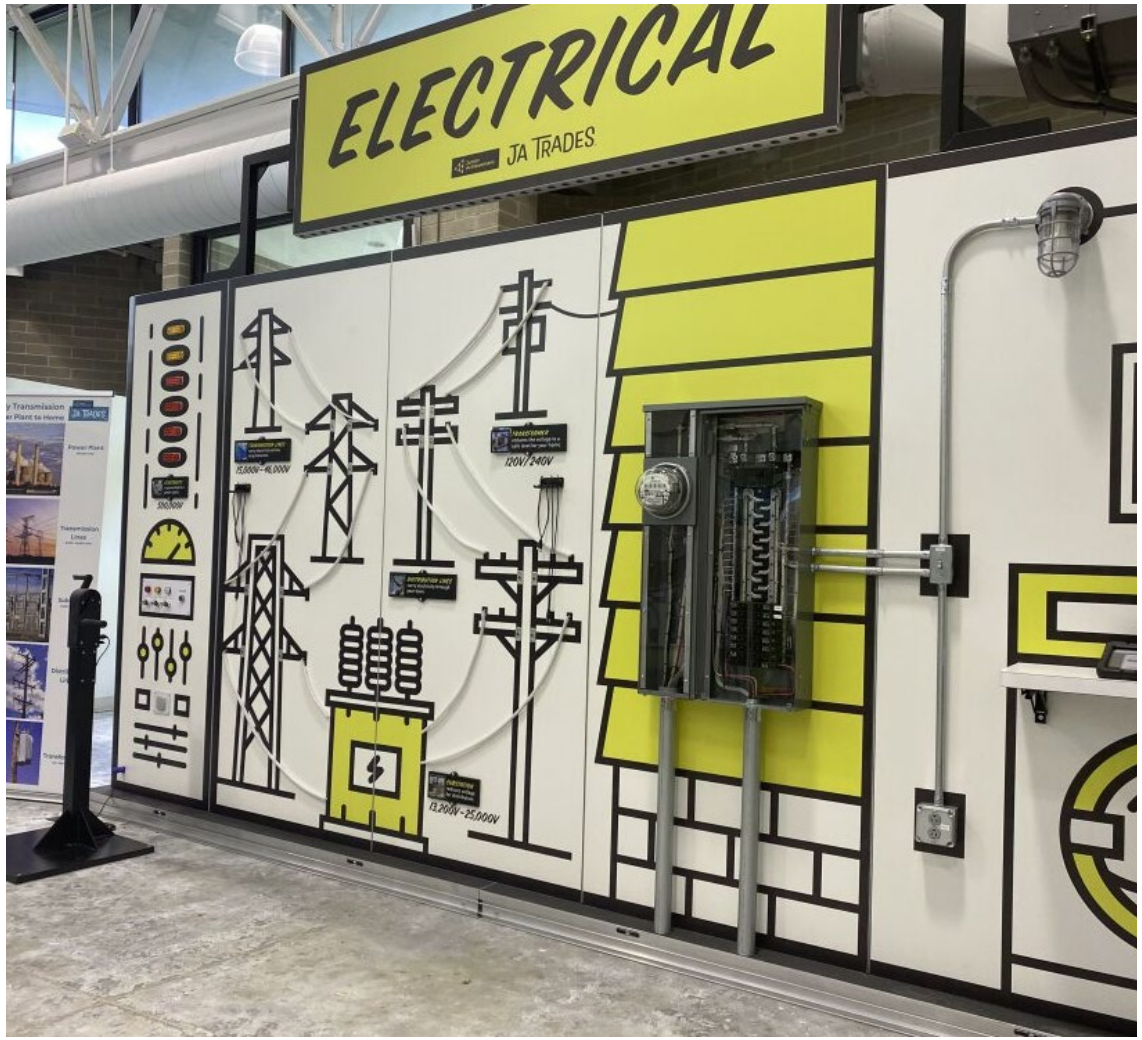
Steps to be Certified

- High School or GED
- Technical School or Community College
- Apprenticeship
- Successful exam completion

The national average pay of an electrician is $70,000.

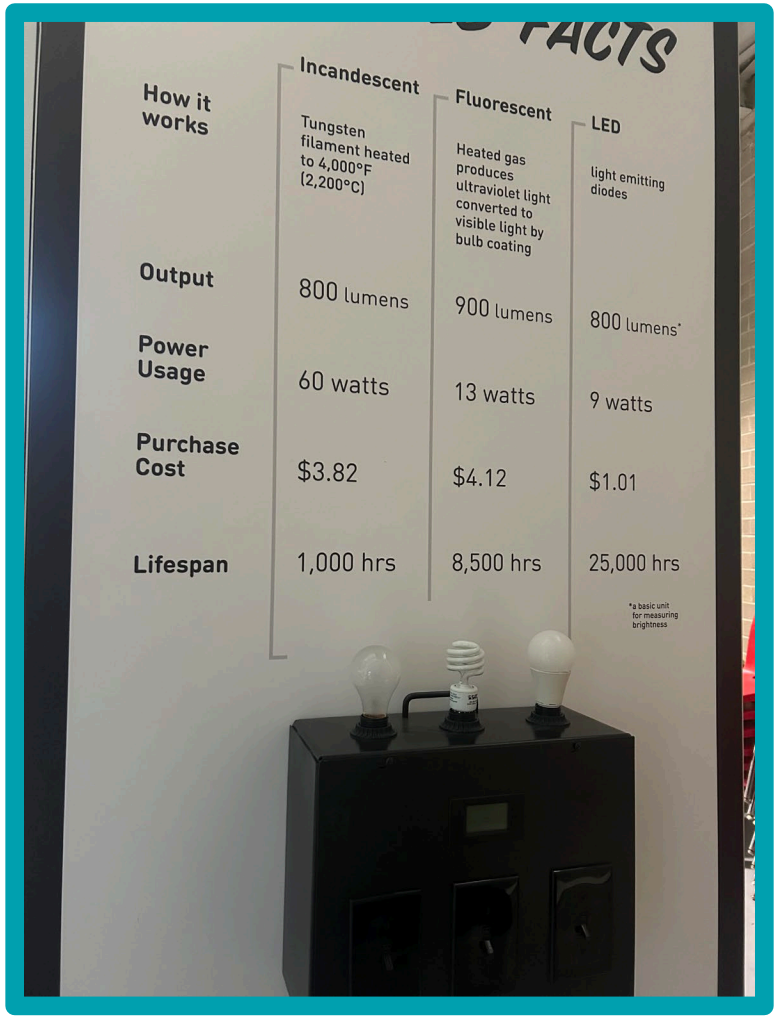
Student Activity

- Crank the generator to make electricity at the power plant.
- Turn keys and start transmission lines to send power out.
- Connect transmission lines to the substation while cranking.
- From the substation, connect to distribution lines.
- Connect distribution lines to the transformer to lower voltage.
- Flip circuit breakers on, then the light switch—your light turns on!

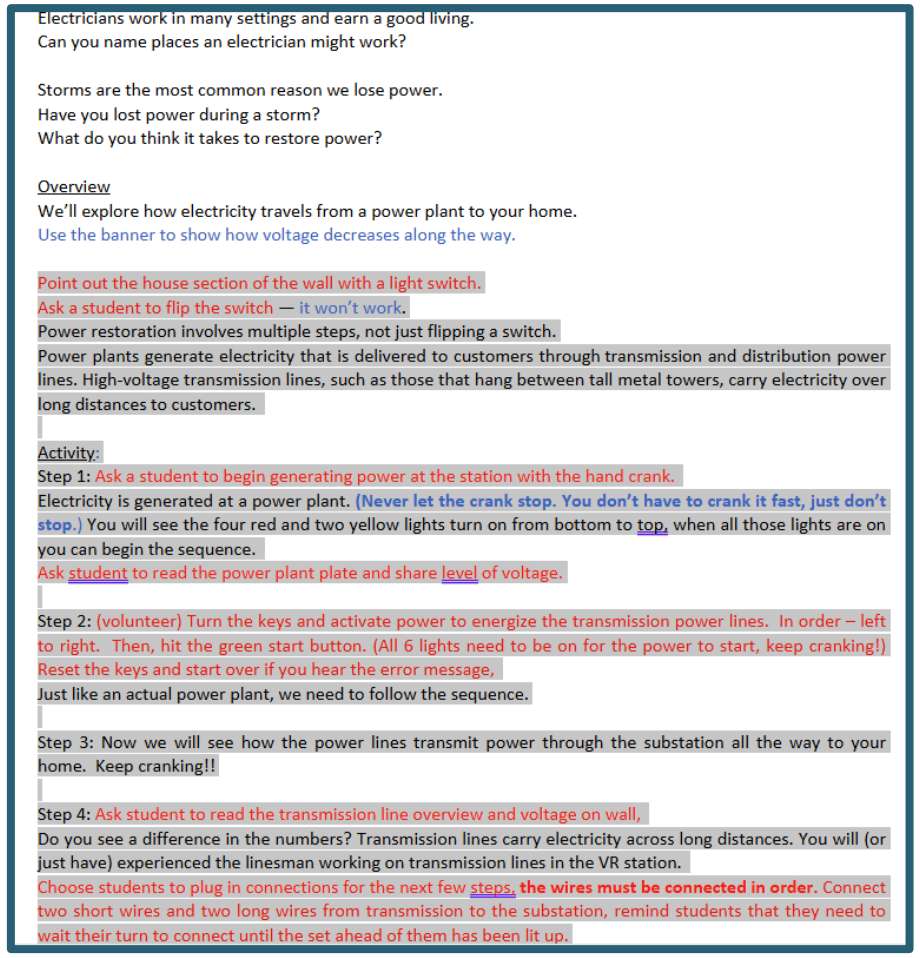


Difference in Light Bulbs

Students will test the effects of three different bulbs to see which one is best.



Simulation Activity Instructions



Electricians work in many settings and earn a good living.
Can you name places an electrician might work?

Storms are the most common reason we lose power.
Have you lost power during a storm?
What do you think it takes to restore power?

Overview
We'll explore how electricity travels from a power plant to your home.
Use the banner to show how voltage decreases along the way.

Point out the house section of the wall with a light switch.
Ask a student to flip the switch — it won't work.
Power restoration involves multiple steps, not just flipping a switch.
Power plants generate electricity that is delivered to customers through transmission and distribution power lines. High-voltage transmission lines, such as those that hang between tall metal towers, carry electricity over long distances to customers.

Activity:
Step 1: Ask a student to begin generating power at the station with the hand crank.
Electricity is generated at a power plant. **(Never let the crank stop. You don't have to crank it fast, just don't stop.)** You will see the four red and two yellow lights turn on from bottom to top, when all those lights are on you can begin the sequence.
Ask student to read the power plant plate and share level of voltage.

Step 2: (volunteer) Turn the keys and activate power to energize the transmission power lines. In order – left to right. Then, hit the green start button. (All 6 lights need to be on for the power to start, keep cranking!)
Reset the keys and start over if you hear the error message,
Just like an actual power plant, we need to follow the sequence.

Step 3: Now we will see how the power lines transmit power through the substation all the way to your home. Keep cranking!!

Step 4: Ask student to read the transmission line overview and voltage on wall,
Do you see a difference in the numbers? Transmission lines carry electricity across long distances. You will (or just have) experienced the linesman working on transmission lines in the VR station.
Choose students to plug in connections for the next few steps, **the wires must be connected in order.** Connect two short wires and two long wires from transmission to the substation, remind students that they need to wait their turn to connect until the set ahead of them has been lit up.

- You will receive a handout with detailed instructions upon your arrival to JA Trades. JA staff will check in to ensure you are comfortable with the task at hand and answer any questions you may have.

THANK YOU!

We look forward to seeing you at JA Trades!

Enjoy the Day!

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