

29 October 2020 – Kentucky 4-H Virtual Experience – Farm and Home wiring

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00:00:08.099 --> 00:00:18.029

Torey Earle: Hi everybody, welcome to the Kentucky 4-H Virtual Experience. Today we're going to concentrate on SET, or Science, Engineering and Technology programs.

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00:00:18.840 --> 00:00:29.250

Torey Earle: My name is Torey Earle and I am an Extension Specialist for 4-H Youth Development with University of Kentucky College of Agriculture, Food and environment Cooperative Extension Service.

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00:00:35.100 --> 00:00:44.670

Torey Earle: For today's Virtual Experience. We're going to look at some concepts that come from the electric excitement. Book number three wired for power.

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00:00:45.300 --> 00:00:56.310

Torey Earle: Now these concepts are going to deal directly with a couple of State Fair projects. One is the simple home circuit and one is the complex home or farm circuit.

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00:00:57.420 --> 00:00:58.170

Torey Earle: Simple

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00:00:59.310 --> 00:01:10.350

Torey Earle: Circuit dealing with one light bulb one single throw switch and the complex circuit dealing with two three ways, which is a light bulb and receptacle.

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00:01:12.390 --> 00:01:20.430

Torey Earle: One of the biggest concerns from our judges at the State Fair each year is actually properly wiring the circuits.

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00:01:22.200 --> 00:01:28.410

Torey Earle: Making sure the correct color wire is on the correct terminal of the outlet or the switch.

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00:01:28.950 --> 00:01:36.330

Torey Earle: Making sure that the wires are stripped to the proper distance, making sure they're put around the screws in the correct way.

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00:01:37.170 --> 00:01:49.350

Torey Earle: So, we're going to look at that. Today I'm going to show you some examples of how to do that and hopefully walk you through the proper way to attach a wire to a receptacle.

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00:01:50.040 --> 00:01:59.730

Torey Earle: And the proper methods for stripping the wire and getting the correct length of stripping on the wire. So, let's get started with our activity.

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00:02:10.890 --> 00:02:18.210

Torey Earle: The tools and supplies, you're going to need for this activity today include the following, you're going to need a standard duplex receptacle.

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00:02:20.100 --> 00:02:21.450

Torey Earle: A pair of wire strippers.

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00:02:23.490 --> 00:02:24.810

Torey Earle: A standard screwdriver

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00:02:26.700 --> 00:02:28.260

Torey Earle: A pair of needle nose pliers

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00:02:29.820 --> 00:02:43.980

Torey Earle: A knife or a cable stripping tool to strip the sheathing off of your romex wire and a piece of romex wire itself to use as an example as to how to put the wire on to the receptacle.

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00:02:45.090 --> 00:02:49.350

Torey Earle: As you can see, I've already stripped the sheathing off of this piece of Romex cabling

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00:02:50.580 --> 00:02:52.830

Torey Earle: And inside or three different wires.

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00:02:54.870 --> 00:02:59.160

Torey Earle: You'll see a white wire a bear copper wire and a black wire.

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00:03:00.450 --> 00:03:07.110

Torey Earle: The black wire is considered the hot wire. It is what carries electricity to the receptacle itself.

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00:03:08.310 --> 00:03:19.740

Torey Earle: The neutral wire or the white wire is considered neutral or a return wire it returns the circuit of electricity back to the breaker box and

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00:03:21.120 --> 00:03:30.780

Torey Earle: The ground wire the ground wire is what attaches the receptacle to the grounding rod that is driven in the ground outside of your house.

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00:03:32.490 --> 00:03:37.920

Torey Earle: Each one of these wires performs, a very specific function. And when we look at the receptacle, you're going to see that.

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00:03:40.260 --> 00:03:48.990

Torey Earle: As we take a look at the receptacle. This is a standard duplex receptacle. And it has two slotted

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00:03:50.940 --> 00:04:05.520

Torey Earle: holes in it, and one half rounded hold the two slotted holds the shorter of the two is for the hot wire. You can tell that she looked at the side of the receptacle. It has brass colored screws.

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00:04:07.170 --> 00:04:24.300

Torey Earle: They longer have the tools for the neutral wire. You can tell that when you look at the receptacle because those are silver screws and the have rounded opening is for the ground wire the ground screw on the receptacle is green. So, you go green for ground.

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00:04:26.610 --> 00:04:28.020

Torey Earle: Silver for neutral.

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00:04:29.400 --> 00:04:33.570

Torey Earle: And brass or copper colored for hot

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00:04:34.920 --> 00:04:43.200

Torey Earle: And each one of these does have or has to be hooked up correctly in order for this to be a correctly wired circuit.

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00:04:47.340 --> 00:04:48.780

Torey Earle: The next thing we're going to do.

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00:04:49.950 --> 00:05:00.810

Torey Earle: It's going to properly strip the ends of each of these wires so we can put them around the screws on the receptacle now and looking at the receptacle itself.

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00:05:01.770 --> 00:05:21.150

Torey Earle: Most modern receptacles will have what they call a strip gauge on the back you can see it right here. And from this point to this point is the proper amount of insulation that you should strip off the wire.

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00:05:22.920 --> 00:05:26.070

Torey Earle: To get that will going to actually lay our wire.

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00:05:27.870 --> 00:05:30.360

Torey Earle: Right on that strip gauge itself.

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00:05:31.440 --> 00:05:33.060

Torey Earle: hold our finger there to market.

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00:05:34.380 --> 00:05:43.080

Torey Earle: This is number 12 gauge wire. So, we'll look on our wire strippers for the whole that has a number 12 decided

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00:05:45.210 --> 00:05:46.140

Torey Earle: We will

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00:05:50.550 --> 00:05:54.870

Torey Earle: Go to our marketplace and turn and turn

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00:05:56.010 --> 00:06:00.390

Torey Earle: And push our installation off that leaves us

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00:06:01.530 --> 00:06:04.050

Torey Earle: The proper amount of wire stripped out

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00:06:05.370 --> 00:06:08.340

Torey Earle: Will do the same thing with our hot wire.

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00:06:09.840 --> 00:06:10.800

Torey Earle: Our black wire.

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00:06:13.950 --> 00:06:15.090

Torey Earle: Go to our number 12

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00:06:16.350 --> 00:06:21.570

Torey Earle: Turn, turn and push our insulation off.

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00:06:22.590 --> 00:06:24.690

Torey Earle: And that gives us

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00:06:27.360 --> 00:06:31.020

Torey Earle: So, I got a little far on that one. So, I'll take a little bit of the end of it off.

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00:06:35.010 --> 00:06:38.880

Torey Earle: That way we get the proper amount of wire stripped

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00:06:41.040 --> 00:06:44.550

Torey Earle: Now each of these wires will go around the screw on the receptacle.

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00:06:45.990 --> 00:07:01.230

Torey Earle: And the key to this is when you put one of these wires on you want the wire to be put around the receptacle. In the same way that the screw will tighten it down. I'll show you why in just a second.

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00:07:02.370 --> 00:07:08.070

Torey Earle: But let's go with our neutral wire. First, I'm going to take

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00:07:09.600 --> 00:07:18.060

Torey Earle: On needle nose pliers. I'm going to slowly band a circle like this, it's going to look like that like a little hook

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00:07:19.590 --> 00:07:21.720

Torey Earle: And then I will put it around.

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00:07:25.620 --> 00:07:26.460

Torey Earle: My screw.

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00:07:32.820 --> 00:07:36.120

Torey Earle: You may have to back screw out a little bit in order to get around it.

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00:07:39.630 --> 00:07:40.980

Torey Earle: Will put it around the screw.

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00:07:42.900 --> 00:07:44.100

Torey Earle: And as you can see

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00:07:45.960 --> 00:07:57.630

Torey Earle: There's no copper wire sticking out from under the screw on either side. That's what that proper strip will give you using the strip gauge now.

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00:07:59.880 --> 00:08:02.460

Torey Earle: Key is I tighten

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00:08:03.480 --> 00:08:04.350

Torey Earle: My wire.

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00:08:06.180 --> 00:08:18.270

Torey Earle: And if you notice the curve of the wire is going the same direction as the screw is tightening and that pulls the wire down underneath the skirt.

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00:08:20.040 --> 00:08:24.450

Torey Earle: If I went the other way with it. I will show you that example.

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00:08:27.720 --> 00:08:29.460

Torey Earle: Turn it over and I put

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00:08:31.530 --> 00:08:35.400

Torey Earle: This through like fat as I would tighten it down.

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00:08:39.180 --> 00:08:48.780

Torey Earle: It actually pushes the wire out from under the skirt. So, you always want to make sure that you have the hook.

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00:08:50.040 --> 00:08:51.000

Torey Earle: Of your wire.

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00:08:52.620 --> 00:08:53.670

Torey Earle: Following

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00:08:55.800 --> 00:08:56.820

Torey Earle: The direction.

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00:08:58.620 --> 00:09:00.180

Torey Earle: The screw tightens.

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00:09:02.100 --> 00:09:03.450

Torey Earle: Put that back on here.

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00:09:06.420 --> 00:09:07.800

Torey Earle: And I'm going to tighten it down.

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00:09:14.040 --> 00:09:15.720

Torey Earle: Leaving any wire.

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00:09:19.140 --> 00:09:20.580

Torey Earle: Taking out past the screw.

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00:09:21.840 --> 00:09:23.940

Torey Earle: I'm going to do the same thing with

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00:09:25.740 --> 00:09:28.170

Torey Earle: My black wire on the other side.

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00:09:31.200 --> 00:09:32.160

Torey Earle: Going to take

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00:09:33.570 --> 00:09:34.350

Torey Earle: Make a hook.

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00:09:38.520 --> 00:09:40.140

Torey Earle: And I will put the black wire.

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00:09:41.940 --> 00:09:43.020

Torey Earle: Around the screws.

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00:09:48.240 --> 00:09:50.400

Torey Earle: And tighten it down.

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00:09:54.810 --> 00:09:58.860

Torey Earle: Or there is no wire sticking out from under the script itself.

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00:10:00.780 --> 00:10:08.370

Torey Earle: Now with our neutral wire. There is no insulation on our with our ground wire, excuse me, our bare wire. There's no insulation on it.

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00:10:08.760 --> 00:10:23.280

Torey Earle: So, we still want to follow the same process. We don't want to have any insulation coming out from underneath the screw or any wire coming out from underneath the screw itself, even though this one is not going to be insulated.

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00:10:25.020 --> 00:10:26.730

Torey Earle: We put it around our screw.

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00:10:29.580 --> 00:10:30.240

Torey Earle: And

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00:10:31.590 --> 00:10:40.320

Torey Earle: we tighten it down with the wire going in the same direction as the screw itself so that tightens everything down together.

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00:10:42.090 --> 00:10:42.720

Torey Earle: And that

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00:10:44.760 --> 00:10:48.360

Torey Earle: Is basically what a properly wired.

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00:10:49.530 --> 00:10:51.630

Torey Earle: duplex outlet should look like.

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00:10:54.120 --> 00:10:59.430

Torey Earle: The individuals who judge our electric projects at the Kentucky State Fair. Our professional electricians.

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00:10:59.850 --> 00:11:13.530

Torey Earle: They are usually employees from one of the electric cooperatives and they donate their time each year to come and do this. They see mistakes like this all the time in people trying to

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00:11:14.700 --> 00:11:17.970

Torey Earle: save a little money by doing it themselves.

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00:11:19.350 --> 00:11:20.070

Torey Earle: Or

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00:11:21.780 --> 00:11:39.960

Torey Earle: Just not knowing the proper way to do things. So, they want to make sure that as for agers do their electric projects that they know the proper way to do things, and that they know the safety risks behind not doing things in the proper way.

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00:11:41.100 --> 00:11:48.330

Torey Earle: They're not trying to be mean about it. They're just trying to make sure that everybody stay safe and learn something while they're doing it.

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00:11:50.760 --> 00:11:59.610

Torey Earle: As you would do your voice electric projects, please make sure to work with. Maybe even work with a local electrician to

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00:12:00.930 --> 00:12:12.600

Torey Earle: Work on some of these more advanced projects that we do like we just saw here with the wiring of receptacle for the farm or home circuit category at the state fair.

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00:12:14.880 --> 00:12:25.860

Torey Earle: Hope this helped and hope this gives you some idea of some of the skills that you would need in order to have a successful state fair project in the 4-H electricity project.

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00:12:27.690 --> 00:12:45.990

Torey Earle: Thank you for joining me today for the Kentucky 4-H Virtual Experience focused on Science, Engineering and Technology. For more information about the 4-H SET program, please check out your local University of Kentucky Cooperative Extension Service.