06 October 2020 – Kentucky 4-H Virtual Experience – Bright Lights

1
00:00:17.250 --> 00:00:27.270
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.

2
00:00:28.020 --> 00:00:38.520
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.

3
00:00:44.760 --> 00:00:55.050
Torey Earle: Activity, we're going to do today is from the electric excitement for H curriculum and from the magic of electricity, which is the first level book.

4
00:00:55.980 --> 00:01:09.480
Torey Earle: The activity is called Bright Lights and, in this activity,, you're going to learn more about what a circuit is. A circuit is a complete circle that electricity has to flow through in order to do work.

5
00:01:10.260 --> 00:01:23.160
Torey Earle: You're going to learn a little bit about a power source. You're going to learn about conductors and insulators and you're going to learn a little bit about a load or an object that will show electricity is doing work.

6
00:01:24.630 --> 00:01:32.760
Torey Earle: Now there's some things you're going to have to gather in before you start the activity today. So, you'll be successful, and you'll have things to work with.

7
00:01:33.360 --> 00:01:50.310
Torey Earle: You're going to need one or two either C or D size batteries right it at 1.5 volts. Each you're going to need a small flashlight bulb, which is rated at three volts or above, and you're going to need a piece of aluminum foil.

8
00:01:51.750 --> 00:02:02.070

Torey Earle: Now our aluminum foil is going to serve as our conductor because of conductors, a piece of metal and some of the more common conductors are copper and aluminum.

9
00:02:03.060 --> 00:02:11.010
Torey Earle: And there's also you can also use in higher end components either silver or gold serve as conductors of electricity.

10
00:02:11.880 --> 00:02:27.660
Torey Earle: And insulator is a material that electricity will not flow through and insulators commonly can be plastic or Styrofoam, cloth or paper or other materials like that that electricity will not flow through

11
00:02:30.750 --> 00:02:32.460
Torey Earle: In doing our activity today.

12
00:02:33.540 --> 00:02:45.330
Torey Earle: Hopefully you're going to also learn a little bit about problem solving and thinking critically and how to work through a situation that you may not always have the instructions for

13
00:02:47.400 --> 00:02:50.250
Torey Earle: Now let's get started with our activity.

14
00:02:52.620 --> 00:03:03.060
Torey Earle: As we start our Bright Lights activity today, we want to make sure that you have all the supplies that were mentioned in the intro handy and able to be used.

15
00:03:05.070 --> 00:03:09.000
Torey Earle: One or two D or C size batteries.

16
00:03:10.680 --> 00:03:17.550
Torey Earle: A small flashlight bulb rated for three volts and a piece of aluminum foil.

17
00:03:19.530 --> 00:03:29.970
Torey Earle: As we mentioned in the intro electricity has to have two things to make a circuit, it has to have a power source, and it has to have a conductor.

18
00:03:30.570 --> 00:03:40.080
Torey Earle: But if you want to see electricity work, you have to have a third thing which is an object for it to show work on which would be considered a load.

19
00:03:42.060 --> 00:03:50.520
Torey Earle: Do you look at your battery, you'll see that it has a positive on one end and the other end is considered negative

20
00:03:52.140 --> 00:03:55.230
Torey Earle: And in order for like Christie to work in a circuit.

21
00:03:56.460 --> 00:04:03.840
Torey Earle: The electricity in direct current which is what batteries are has to flow from the positive to the negative

22
00:04:05.310 --> 00:04:09.060
Torey Earle: To see it work, you have to have the load in between.

23
00:04:10.290 --> 00:04:17.640
Torey Earle: So, our challenge today is to get the electricity to flow from the positive

24
00:04:19.080 --> 00:04:22.020
Torey Earle: Through the load and back to the negative

25
00:04:23.460 --> 00:04:27.420
Torey Earle: To do that we're going to have to use our conductor, which is our aluminum foil.

26
00:04:28.800 --> 00:04:33.750
Torey Earle: Now you may trust several ways to do this, but I'm going to show you one.

27
00:04:34.980 --> 00:04:41.610
Torey Earle: That will make you pretty successful and then you may want to try to get creative.

28
00:04:43.260 --> 00:04:44.580
Torey Earle: Now I will do a warning.

29
00:04:46.170 --> 00:04:47.250
Torey Earle: Do not

30
00:04:48.420 --> 00:04:55.440
Torey Earle: Connect your conductor. Your aluminum foil directly from the negative of the battery to the positive

31
00:04:56.580 --> 00:05:12.000
Torey Earle: The electricity will flow and it will do work, but you won't be able to see the work you'll probably be able to feel it, because it will be like a little heater and it will get warm. So please don't do that without putting the load in.

32
00:05:15.720 --> 00:05:35.220
Torey Earle: On your flashlight bow itself. There's a small button on the bottom that you can see there's probably either a black or white piece of plastic around plastic serves as an insulator, which is a material that electricity will not flow through

33
00:05:37.020 --> 00:05:48.780
Torey Earle: The button itself is metal and the casing around the ball that holds it all together is metal, metal is a conductor or a material that electricity will flow through

34
00:05:50.640 --> 00:06:03.630
Torey Earle: So, the idea is the button on the bottom is positive, the casing around the outside is negative. What we have to do is connect those two we can set the positive

35
00:06:04.650 --> 00:06:10.920
Torey Earle: On the positive pole a battery, but electricity still not flowing because it doesn't come from the negative to the negative

36
00:06:11.970 --> 00:06:14.790
Torey Earle: So what we can try to do is make

37
00:06:15.990 --> 00:06:24.420
Torey Earle: That negative on a light bulb touch the negative on the bottom of the battery and let's see what happens.

38
00:06:28.560 --> 00:06:29.640
Torey Earle: We get a little bit like

39
00:06:31.710 --> 00:06:43.890
Torey Earle: I said these light bulbs are probably rated for three volts or maybe a little higher, and the voltage is what provides the power for the light So,

40
00:06:45.540 --> 00:06:47.400
Torey Earle: Let's take a second battery.

41
00:06:49.020 --> 00:06:56.850
Torey Earle: Touch the negative to the positive on the first battery and then touch the light bulb to the positive on both batteries.

42
00:06:57.420 --> 00:07:14.460
Torey Earle: And we get a lot more light because we have doubled the voltage each one of these batteries is rated at 1.5 volts. So, 1.5 plus 1.5 equals three volts, which doubles the amount of electricity that's going into our light bulb.

43
00:07:17.850 --> 00:07:19.440
Torey Earle: As you would experiment with this.

44
00:07:21.180 --> 00:07:27.630
Torey Earle: You might get a little longer piece of aluminum foil get a third battery. What do you predict will happen.

45
00:07:28.920 --> 00:07:35.250
Torey Earle: Try it and see. And then you can report back and let us know what you found out

46
00:07:37.050 --> 00:07:50.820

Torey Earle: As we finished up a Bright Lights activity today. What were some things that you learn. Did you have to problem solve. Did you have to think creatively in order to figure out how to make the flash light bulb, light up.

47
00:07:52.320 --> 00:07:59.430
Torey Earle: Did you learn how electricity flows in a circuit and what the components were to that circuit to help the electricity flow.

48
00:08:00.540 --> 00:08:07.680
Torey Earle: Keep all these things in mind because as you would do this, this could be the beginning of your 4-H electric project.

49
00:08:08.790 --> 00:08:24.330
Torey Earle: In the coming weeks. We're going to go through a few more of the key things that you would need to know in order to do an electric project for Kentucky, for he also going to show you a few things that

50
00:08:25.980 --> 00:08:31.350
Torey Earle: Could lead to building a state fair project in the 4-H electric project.

51
00:08:32.580 --> 00:08:44.730
Torey Earle: Not going to show you exactly what a state fair project looks like, but we are going to show you some of the skills you would need in order to develop your own state for each fair project for the electric project.

52
00:08:46.620 --> 00:09:04.860
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 program, please check out your local University of Kentucky Cooperative Extension Service.