

101+ AMAZING Science Project Ideas: ELECTRICITY



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- Gives you a brief survey
- Recommends projects that are best for you

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[Crank Up the Music!](#)

Ever been at the beach, taking in the sun and surf, listening to the Beach Boys play on your radio when suddenly it runs out of batteries right in the middle of California Girls? Okay, maybe this only happens to grey haired parents. You being younger and smarter use a hand-powered crank radio to listen to the latest pop tunes on Radio Disney. If batteries and Beach Boys are too old-school for you, then this may be the perfect experiment.

[Difficulty](#) = 1

[Rubbing Up Against Static Electricity](#)

A tried and true balloon activity is to rub a balloon on your head to make your hair stand up. How does the rubbing build up static electricity? Do this experiment to see if the number of rubs makes a difference.

[Difficulty](#) = 1

[Pencil Resistors](#)

Want to know how electrical engineers "trap" the energy in a circuit to make your favorite electrical appliance? Video games, computers, phones, and many other electrical devices use "resistors" in different ways to control the electricity in a circuit. In this experiment, you can make your own resistors out of pencils, and test the effect a resistor has on a circuit.

[Difficulty](#) = 2

[Which Materials are the Best Conductors?](#)

There are two main types of materials when it comes to electricity, conductors, and insulators. What are they made of? Find out by testing different materials in a circuit to see which ones conduct the most electricity.

[Difficulty](#) = 2

[Induction: How Many Coil Turns Do I Need?](#)

How can toilet paper help you understand the mighty power of magnetic induction? By wrapping each roll with more turns of wire, you can figure out the best way to light up a bulb.

[Difficulty](#) = 3

[How Do Different Materials React to Static Electricity?](#)

When your parents were kids, they probably wore polyester. Static cling was a major household issue! Now everybody wears cotton, which doesn't get static cling nearly as much. Why are some materials more susceptible to static cling than others? Learn how different materials react to static electricity in this experiment.

[Difficulty](#) = 3

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[Shaking Up Some Energy](#)

Have you seen the new Shake N' Light flashlights on TV? How do they get energy to light up the bulb without using batteries? Do this experiment to make your own motion powered generator and find out.

[Difficulty](#) = 4

[Rock On! Recording Digital Data with Magnets](#)

This is a straightforward project that shows you how data can be digitized and stored on magnetic recording media. You'll learn how alpha-numeric characters are digitized, and you'll use bar magnets to represent the individual data "bits." You'll also learn about how much information can be stored in a small space (recording density), and how magnetic data can be erased.

[Difficulty](#) = 4

[Veggie Power! Making Batteries from Fruits and Vegetables](#)

Did you know that you can get electricity out of a potato? In this project you will learn how to build a simple battery using a variety of different fruits and vegetables - REALLY! You'll be able to figure out things like: How many lemons does it take to turn on a light bulb? Does an orange make a better battery than a potato? Can you use each segment of a grapefruit to make a super-grapefruit battery? You will also learn some of the basics of electricity and circuits: What is voltage? What is current? What is resistance? How much power can you get out of a veggie battery? Does an orange battery run out of "juice"? So, do a little produce shopping and then learn about batteries and electricity.

[Difficulty](#) = 4 – 7

[Rock'n'Roll Radios \(Updated Version\)](#)

Here's a project that shows you how to build your own radio receiver! You'll learn the basic circuit elements required for receiving radio signals, and you'll be able to listen to AM radio broadcasts with something you made yourself. A nice feature of this project is that you can make it as easy or as advanced as you want.

[Difficulty](#) = 4 – 9

[The Strength of an Electromagnet](#)

Electric charges in motion create magnetic fields. You can create an electromagnet with a simple coil of wire and a battery. This project has ideas for exploring how the strength of the electromagnet depends on the size of the coil or the voltage supplied to it.

[Difficulty](#) = 4

[Cool Junctions](#)

Everyone is familiar with the idea that electric current passing through devices can heat them up. Most of us have used appliances like electric stoves, hair dryers, and toasters that are made specifically for heating. We've also noticed that things that run on electricity get warm when the current is turned on. Have you ever turned this relationship around and wondered if it is possible to use heat to produce current? Did you ever wonder if it is possible to cool things using electrical current? If so, then look no further! Check out this project to learn about thermoelectricity.

[Difficulty](#) = 5 – 7

[Batteries: The Shocking Truth](#)

Here you'll find what you need to scientifically assess battery performance. You'll learn about how batteries work, how they wear out and, most importantly, how to make valid measurements to assess battery performance over time.

[Difficulty](#) = 5

[Building an Electric Motor](#)

Another way to explore the inter-relationship of electricity and magnetism is to build your own

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electric motor. This project contains detailed information on exactly how to do it, including a Really Clever Trick.

[Difficulty](#) = 5

[A Cool Way to Make Electricity: Solar Cell Power Output vs. Temperature](#)

Solar cells provide a clean way of making electricity directly from sunlight. In this project you will build a simple circuit and experimental setup to investigate whether the power output of a solar cell changes with ambient temperature.

[Difficulty](#) = 5

[Conductance as a Water Quality Measurement](#)

Did you know that firefighters never spray water on an electrical fire? That's because ordinary tap water conducts electricity. This project will show you how to measure the conductance of water, and how to relate your measurements to water quality.

[Difficulty](#) = 5

[Solar Speedway](#)

Solar power is hot these days. Gleaming, black solar panels soak up rays on more and more rooftops of homes and businesses providing a clean, alternative source of heat and electricity. You might guess that different times of the day yield different levels of solar power. But just how much does the sun's position in the sky affect the power that solar cells and panels can generate? That's the question this project is all about.

[Difficulty](#) = 5 – 8

[How Does Solar Cell Output Vary with Incident Light Intensity?](#)

Solar cells are an alternative method for generating electricity directly from sunlight. With this project, you can get down to the atomic level and learn about the world of solid-state electronics as you investigate how solar cells work. Your experiment will measure the effect of changing light intensity on power output from the solar cell. A possible variation would be to investigate the effect of changing the color of the light.

[Difficulty](#) = 5 – 7

[Where There Is Charge, There Can Be Sparks!](#)

Have you ever gotten a shock touching a doorknob after walking across a carpet? Static charge is responsible for that shock. Wouldn't it be cool to save up and store all of that charge in a homemade jar? It would almost be like storing lightning. This science project will show you how to do that.

[Difficulty](#) = 6

[How Does LED Brightness Vary with Current?](#)

LEDs (light-emitting diodes) are electronic components that convert a portion of the current flowing through them into light. How does the intensity of the light produced vary with the current flowing through the LED? To find out, you'll build some simple circuits to vary the current flowing an LED. You'll also build a simple light-to-voltage converter circuit to measure LED output.

[Difficulty](#) = 6 – 8

[How Far Can Sparks Jump?](#)

Piezoelectric barbecue fire starters work by creating a spark that ignites the volatile lighter fluid, which then starts the charcoal burning. They are low current, high voltage devices. How high does the voltage have to get to make a spark in air? This project shows you a way to find out by with an inexpensive experimental setup to measure the distance that the spark can travel between two spherical electrodes.

[Difficulty](#) = 6 – 9

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[Where Is 'Full Sun' No Brighter than Twilight?](#)

How far would you have to travel so that the light of the full sun would provide "daylight" no brighter than twilight on Earth? This project describes a method to verify the inverse square law: how light, sound, electrical signals, and gravity each decrease with distance from their source. When you have finished your experiment, you can use your results to calculate an answer.

Difficulty = 6 – 9

[Linear vs. Logarithmic Changes: What Works Best for Human Senses?](#)

If you want to get your friend's attention at a crowded sporting event with lots of people cheering, you need to shout. If you're trying to do the same thing in a quiet library, a whisper works. The detection limit for each of our senses depends on the amount of "background" stimulation that is already present. This project uses an LED control circuit to investigate detection of changes in light levels.

Difficulty = 7

[Color Mixing with Red, Green, & Blue LEDs](#)

This is a good project for someone who is interested in both electronics and color vision. The equipment needed is on the expensive side, but if you continue studying electronics, you can use it again and again.

Difficulty = 7 – 8

[How Long Does It Take to Fry a Diode?](#)

If you have ever built an electronic circuit with a soldering iron, you know that the component leads get *hot*. How much of that heat gets into the device you're soldering? This project shows you how you can use a silicon diode as a temperature sensor to find out.

Difficulty = 7 – 9

[Testing a Parabolic Reflector with Light from an LED](#)

You can see examples of parabolic reflectors in flashlights, car headlights, satellite TV antennas, and even on the sidelines at football games. How do these "dish" antennas work to gather signals? What is the best position for placing the detector for these antennas? In this project, you can use an LED and a simple photodetector to find out for yourself.

Difficulty = 7

[Make Your Own Electric Guitar Pickup](#)

If you like playing electric guitar, this could be a cool project for you. Have you ever wondered how an electric guitar works? In this project you'll wind one or more of your own electric guitar pickups and test them out in an inexpensive electric guitar. How will the sound change with the number of turns you use in the coil? Or with the strength of the magnets you use?

Difficulty = 7 – 9

[Make Your Own Piezoelectric Pickup for Acoustic Guitar](#)

In this project you'll learn how to make a piezoelectric pickup for acoustic guitar using inexpensive components. You can then connect your acoustic guitar to an amplifier, and record your own music. If you are interested in electronics and like playing acoustic guitar, this could be the perfect project for you.

Difficulty = 7 – 9

[Two-Point and Four-Point Methods for Measuring Small Resistances](#)

Measuring the value of a resistor with an ohmmeter is pretty simple. You connect the meter to the resistor, and read off the measurement from the meter. But what if the resistance you want to measure is very low? This project shows you how to use a four-point resistance measurement method to measure low resistance values.

Difficulty = 7

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[Make Your Own Low-Power AM Radio Transmitter](#)

Have you ever wondered how an AM radio station works? In this project you will learn the basics of how your favorite songs are transmitted by a radio station. You will learn how you are able to tune to your favorite station and listen to music. This is a very simple project that requires very few materials to make, but it gives a basic knowledge of how a radio transmitter works.

[Difficulty](#) = 7 – 9

[Measure Your Magnetism](#)

Do you know how to find the north and the south poles of a magnet? What materials are more magnetic than others? Is there a way to measure how strong a magnet is? Is there a way to measure the strength of an electromagnet? How much does the material that is in the core of the electromagnet affect its magnetic strength? With this project, you'll be able to answer these questions and many others. You will learn how to build and use a simple meter for measuring magnetic field intensity.

[Difficulty](#) = 7

[Recording on a Wire](#)

Today magnetic recording is used in audio and video cassette recorders, and computer disk drives. Did you know that you can also use an electromagnet to record and play back from a steel wire? In fact, this is how magnetic recording got started. This project shows you how to build a simple wire recorder.

[Difficulty](#) = 8