101+ AMAZING Science Project Ideas: GEOLOGY

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- Recommends projects that are best for you

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Soil Compaction
Have you ever had to dig a hole in really hard dirt? It is a lot of work! In this experiment you can make an instrument to test the soil and find out how compacted it is, before you dig!
Difficulty = 1

Porosity and Particle Size
Often, when we think of something that is solid we think about rocks. But in reality, rocks have tiny holes of air inside them. This is called porosity. In this experiment you can find out what it means to be "solid as a rock!"
Difficulty = 2

Soil Color and Moisture
When you step in mud it can be very messy! How can you tell if soil is wet or dry before you step in it? In this experiment, you can see if color can help you figure it out.
Difficulty = 3

Sorting out Sedimentation
Sedimentary rock forms in layers that are deposited one after the other over long periods of time. Often times sedimentary rock contains fossils and other debris that are deposited within the layers. How do sediments form? How are sediments of different shapes, sizes, and types sorted during the process of sedimentation?
Difficulty = 4

Growing a Soil Menagerie
Everything on our planet is linked by a giant recycling system called the *biogeochemical cycle.* Learn how our planet recycles and reuses everything we need to support life by making a miniature biosphere. Which nutrients will be important for your miniature life-support system?
Difficulty = 5

How Fast Do Seismic Waves Travel?
Here's a cool geology project that uses historical seismograph data that you can collect from the comfort of your own computer. You'll use a web interface to a network of seismometers run by the Northern California Earthquake Data Center, at the University of California, Berkeley. From the seismograms you make, you will be able to measure the time it took for the seismic waves to travel from the earthquake epicenter to the recording station in California. Once you measure the distance between the two points, you will be able to calculate the speed of the seismic waves. Check it out!
Difficulty = 5 – 8

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Ring of Fire 1: What Volcanoes Tell Us About Plate Tectonics
The Ring of Fire is a region of volcanic and earthquake activity that surrounds the Pacific Ocean. In this project you can explore the connection between plate tectonics and volcanic activity by mapping historical data.
Difficulty = 5 – 6

Ring of Fire 2: What Earthquakes Tell Us About Plate Tectonics
The theory of plate tectonics revolutionized geology in the 1960's. In this project you can explore the connection between plate tectonics and earthquakes by mapping historical seismic data.
Difficulty = 5 – 6

Is There a Whole Lot of Shaking Going On? Make Your Own Seismograph and Find Out!
If you live in an area where earthquakes happen, you might be especially interested in this science project. You'll learn how to build your own seismograph and how to use it to detect ground motion.
Difficulty = 6 – 7

Get Some Practice at 'Fossil' Reconstruction with Owl Pellets
Are you fascinated by dinosaurs, fossilized bones, and fossilized plants? Although this project is not based on actual fossils, you will get good practice at reconstructing an animal's skeleton from individual bones. You'll use what you find to identify the types of prey that owls consume.
Difficulty = 6

Beach Bum Science: Compression of Wet Sand
Did you ever notice the cool patterns around your footprints when you take a walk in the wet sand at the beach? The pressure of your feet has effects far outside your footprints. Here's a project that uses a simple experimental apparatus to investigate how the volume of wet sand changes under pressure.
Difficulty = 6

Locating the Epicenter of an Earthquake
When an earthquake happens, how are scientists able to determine the original location of the quake? In this project, you'll use archived data from a network of seismometers to find out for yourself. You'll create your own seismograms from the comfort of your own computer with an easy-to-use webpage interface. Then you'll analyze your seismograms to determine the distance of the quake from each seismometer station. By mapping your analyzed data, you will be able to determine the location of the quake.
Difficulty = 6 – 8

Factors that Affect the Transfer of Force through Saturated Soil
Earthquake damage can be intensified in areas that are subject to soil liquefaction. For example, in these areas, soil movement may cause foundations to collapse, while structures in nearby areas built on more stable soil or bedrock may escape relatively unscathed. This project uses readily available materials to determine whether soil additives can reduce the tendency to soil liquefaction.
Difficulty = 6

Underground Water Flow and Darcy's Law
This project shows you how to build a simple model system to simulate underground water flow. Underground water flow is important for understanding replenishment of underground aquifers, migration of underground contaminant plumes, and cave formation. With your model system, you can simulate various underground conditions, and test your predictions about the effects they have on water flow.
Difficulty = 6 – 7

Under Pressure: Sand Under Lateral Compression
Here's a project that involves a different kind of sandbox than the ones you usually think of. This one has a moving wall inside, acting like a piston, to compress the sand. You can make layers using two different colors of sand, and then see what happens when you compress the layers with the piston. If you're handy with woodworking tools, this is a good project to give you a feel for the effects of geological forces that deform the Earth's crust.
Difficulty = 7 – 8

Locating an Earthquake Using a Global Seismic Network
When an earthquake happens, how are scientists able to determine the original location of the quake? In this project, you'll use archived data from a global network of seismometers to find out for yourself. You will make your own seismograms using the Global Earthquake Explorer program, and then use the seismograms to determine the location of earthquake epicenters.
Difficulty = 8

Lichenometry: An Accessible Method for Dating Recent History (Geological and Manmade)
Geology and archeology are examples of historical sciences. Their practitioners rely on multiple methods for establishing dates and temporal sequences as they seek to construct a history from the available evidence. This project will show you how you can use the method of lichenometry as a method for dating relatively recent events in your area, such as the building of a stone wall, or the occurrence of a rock slide.
Difficulty = 8

Measuring the Diameter of the Earth's Core with Seismic Waves Around the Globe
When an earthquake occurs, seismic shock waves travel out through the earth from the source of the event. The shock waves travel through the earth (body waves), or along the Earth's surface (surface waves), and can be recorded at remote monitoring stations. There are two types of body waves, P-waves and S-waves. S-waves cannot travel through the Earth's liquid core, which means that there is a limit on how far primary S-waves can travel. You can use this 'seismic shadow' to estimate the diameter of the Earth's core. This project shows you how.
Difficulty = 9

A Ground-Breaking Revelation: Testing Compression Waves in Various Circumstances
Here's a cool project for studying compression waves in different soil types. It uses a homemade wave tank for solids, with a frequency generator, amplifier, and loudspeaker as the vibration source. There are lots of interesting possibilities for variations with this one.
Difficulty = 9