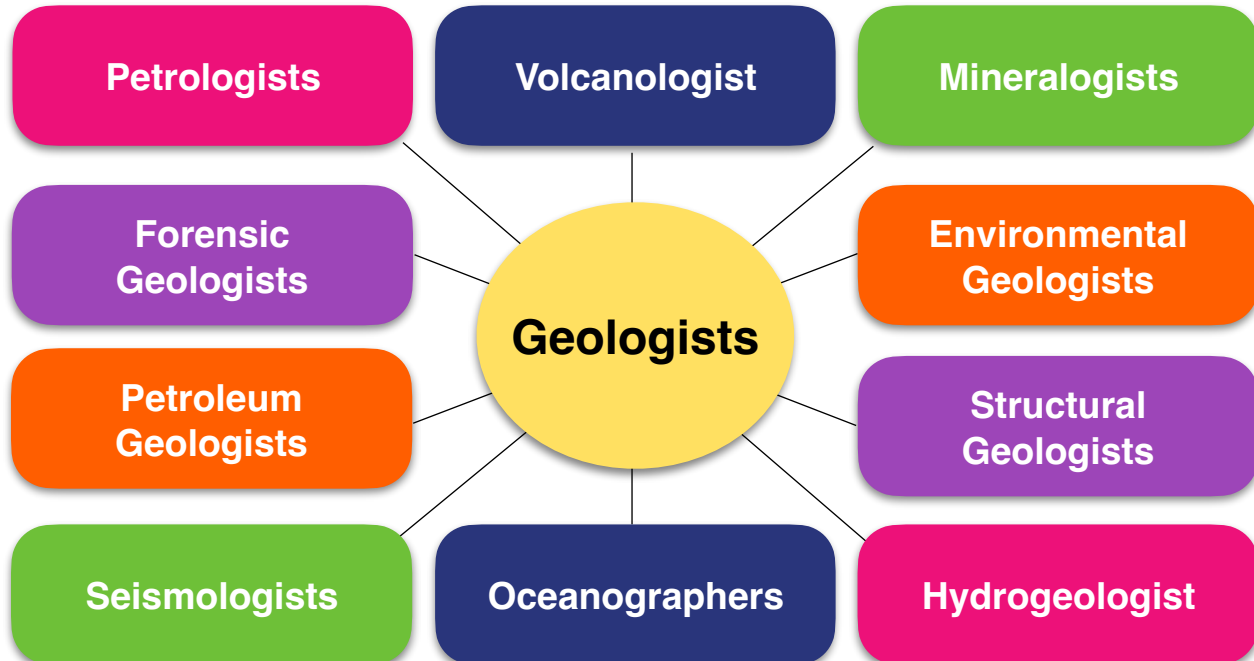


If I am an Earth Scientist...

I study the physical aspects of the Earth, such as its composition, structure, and processes, to learn about its past, present, and future. The Earth's layers are a record of what the Earth was like in the past. Studying the Earth is a great career for people who love the outdoors and figuring out how things used to be and why things are the way they are today. There are a lot of different ways to be an Earth scientist. One type of earth scientist, the geologist, is concerned with the solid Earth, the rocks of which it is composed, and the processes by which they change over time. There are over 20 types of geologists, many of which combine geology with other fields of science. By doing the experiments in this kit, you will learn about each of the types of geoscientists shown below.



What's In Your Experiment Set?



- A. Rock Collection
- D. Sand Model
- G. Measuring Tape
- J. Spring
- M. Digital Balance

- B. Stirrers (6)
- E. pH Test Strips (4)
- H. Beakers (2)
- K. Measuring Cup
- N. Shovel

- C. Fold/Fault Model
- F. Fossil Fuel Model
- I. Magnifying Lens
- L. Foam Cups (6)
- O. Soil/Rock/Sand

- Item included but not pictured: laminated card with pH color code
- Additional Items required: 2 AAA batteries, colored pencils, distilled water, paper towels, phone with a flashlight and stopwatch, raw egg, scissors, and washable marker.

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Standards

The Next Generation Science Standards (NGSS) are science content standards.

MS-PS1: Matter and Its Interactions

MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

MS-PS1-5 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

MS-PS2: Motion and Stability: Forces and Interactions

MS-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

MS-PS2-5 Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

MS-PS4: Waves and their Applications in Technologies for Information Transfer

MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

MS-ESS2: Earth's Systems

MS-ESS2-1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

MS-ESS2-2 Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MS-ESS3: Earth and Human Activity

MS-ESS3-1 Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and resources are the result of past and current geoscience processes.

MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ESS3-4 Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

MS-ESS3-5 Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

MS-ETS1 Engineering Design

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Safety

Emphasize to students the importance of following all instructions and warnings, and the importance of carrying out only those experiments that are described in this manual.

1. The activities in this manual are not suitable for children under 10 years. Keep younger children and animals away from the activity area. Store the kit out of reach of young children.
2. Read the instructions before use, follow them and keep them for reference.
3. The area surrounding the activity should be kept clear of any obstructions and away from the storage of food. It should be well lit, ventilated, and close to a water supply.
4. Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.
5. Do not eat, drink, or smoke in the activity area.
6. Students should not wear loose clothing. Long hair should be tied back.
7. The work area should be cleaned immediately after carrying out the activity.
8. Wash hands after carrying out the activities.

First Aid Information

- In case of eye contact: Wash out eye with plenty of water, holding eye open.
- If swallowed: Wash out mouth with water, drink some fresh water. Do not induce vomiting.
- In case of inhalation; Remove person to fresh air.
- In case of skin contact: Wash affected area with plenty of water for at least 10 minutes.
- In case of cuts: Clean and dress the wound with a clean, dry first aid bandage.
- In case of doubt: seek medical advice without delay.