



Physical Science Application-Based Activities

Included in McGraw Hill Connect

With the new Application-Based Activities for Physical Science in McGraw Hill Connect, students can learn how their everyday behaviors actually affect the environment. These real-life activities will help students think critically about topics such as climate change, energy sources, and natural disasters. These new activities include:

Assessing the Potential for Earthquakes

In this activity, you will assess the potential for earthquakes at several locations in the United States of America.

Assessing Volcanic Eruption Potential and Hazards

In this activity, you will take on the role of someone moving to the Tacoma, Washington area. You will work through the geology and volcanic hazards of the area so you can choose a safe place to live.

Deformation

In this activity, you will be flown around the desert in Iran to observe the results of interactions between rocks, the forces that deform them, and erosion. The video will pause at times, and you will be asked questions about what you are seeing on the screen.



Deltas

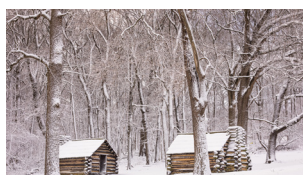
In this activity, you will be flown around Earth to observe the interactions between streams, sediments, and water bodies. These interactions commonly produce a classic, triangular-shaped delta, but, at other times, variations on this classic shape can also develop.

Distance

Time Graphs and Velocity – Time Graphs—In this activity, you will play the role of a student observing traffic from a roadside.

Dual Nature of Light

In this activity, you will play the role of a photon, who needs to determine which description of light is correct: wave description or particle description (spoiler alert: it is both, simultaneously).



Effects of Climate Change

In this activity, you and your friends are driving back to college after a weekend getaway. On the way up to the cabins, you were all studying for a quiz about positive and negative feedback systems. Your friend Micky kept talking about how much snow there was.

Energy Sources

An activity focusing on energy sources, costs, and carbon footprints.

Feedbacks

In this activity, you and your college friends are headed to the mountains for a break from school. All but one of you need to study for an upcoming test and decide to use the time in the car to review feedback systems. You need to know what negative and positive feedback systems are, and you need to know examples of each

Gas Laws: Boyle's Law & Charles's Law

Boppo the Clown and Mike the Balloon Artist are working at the county fair. They must keep the ideal and real gas laws in mind while performing their duties.

Glaciers

In this activity, you will be flown around the Northern Hemisphere to observe glaciers and glacial landforms using a recorded Google Earth video

Groundwater Overuse

In this activity, you will follow a series of choices that will allow you to better understand groundwater issues in the California central valley with application elsewhere.

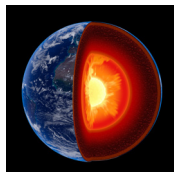


Hurricanes

You are about to begin a summer internship with the National Hurricane Center in Miami. This is your online orientation with your supervisor. You will go through an informal quiz (of sorts) along with another intern to make sure that you understand the basics of hurricane formation and movement. You will be assessed on your ability to evaluate meteorological data presented on maps and to describe the factors that affect hurricane formation and movement in the Atlantic Ocean. You will also make some predictions on the paths of hurricanes, since this is a large part of what scientists do at the NHC.

Inner Planets

In this activity, we will tour the inner planets of our solar system to test your knowledge of these small rocky planets. We will challenge you on your knowledge of their moons and their characteristics, also concentrating on their physical relationships to each other. You should have a basic understanding of the solar system and what makes each of the inner planets unique before embarking on this tour.



Internal Structure of Earth

You and your geology work group decide to compare the conditions of the internal Earth as portrayed in the classic novel, *Journey to the Center of the Earth*, by Jules Verne to scientific evidence. For this creative project, you will need to identify Earth's internal layers and the properties of those layers. You and friends will rely on the behavior of seismic waves in order to help identify Earth's various layers.

Landslides

The Interstate 40 corridor between Asheville, NC and Knoxville, TN is in a constant state of repair. The primary challenge is landslide hazards associated with a number of geologic/environmental factors present. Those factors are rooted in slope angle and rock type, but they are further exacerbated by periods of intense rainfall, coupled with planes of weakness in the rocks roughly parallel to the slope.

Measurement

In this activity, you will play the role of a person helping their friend mix hair dye for a color treatment.

Momentum

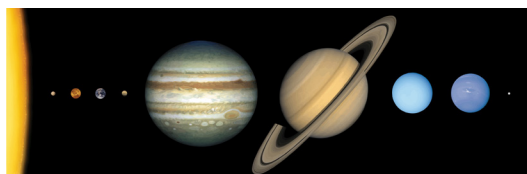
In this activity, you will be an amusement park ride designer for the “Bumper Buddies Ride Company.”

Ocean Currents

In this activity, you will be flown around the World Ocean and asked about the direction and relative temperature of surface currents, and the influence of ENSO and the Coriolis effect on the currents.

Oil Shale

In this activity, you will take on the role of an energy specialist for a finance firm. They are interested in expanding their energy portfolio and your job is to provide them with accurate information about shale oil.



The Outer Planets

In this activity, we will take a short tour of the outer solar system, visiting the four planets in order and making a last stop at Pluto. After identifying each planet, we will discuss what makes it unique and ask you about some of its distinguishing characteristics. We will also visit some of the more outstanding moons—there are a lot of them! Before you begin, you should have a basic understanding of the conditions in the outer solar system. We’ve employed some famous and interesting guides for this tour, so enjoy and learn!

Prevailing Winds

In this activity, we will fly around the World Ocean, stopping at different locations to ask you about the names and directions of prevailing surface wind patterns and the influence of the Coriolis effect on those winds.



Properties of Water

In this activity, you will assume the role of an undergraduate attending a scientific conference on glaciers and alpine ecosystems. You attended the morning session of talks and are about to have lunch with two of the speakers, a professor and his graduate assistant. You have an upcoming paper due in your science writing class and are thinking about doing it on the properties of water.

Radiation and the Atmosphere

In this activity, you will be stopping by your instructor’s office hours to go over how solar radiation interacts with the atmosphere. You have been paying attention in class but probably have not reviewed your textbook or notes enough. You need a review before your next quiz.

The Scientific Method

This activity will test your knowledge of the scientific method, lead you through the formation of a scientific hypothesis, and allow you to analyze real scientific data.



Soils

Soils are unique near-surface materials that form in places as a result of weathering and biologic activity. Because soils form as a result of surface stability, horizonation develops, which can assist in the interpretation of soil formation factors. These factors are in turn controlled by environmental conditions, which in turn can be helpful in assessing environmental change through time, particularly as it relates to archaeological and anthropologic sites.

Subduction Zones

One of the most significant relationships between adjacent tectonic plates is the result of a collision between oceanic plates. The density and momentum of an oceanic plate can cause it to slide under, or “subduct,” beneath its counterpart. This action takes older rock from the sea floor, along with sea water, and volatilizes/melts those products at depth. The action of the two plates also pulls the tectonic boundary down to a lower position on the earth’s surface, producing a distinct trench. It is a combination of these factors that frequently leads to volcanic and seismic activity along the non-subducting plate.



Tides

In this activity, we will test your knowledge of the tides. Before you start, you should know what causes the tides and be familiar with the terminology used to describe them. The image you see here is along the coast in the Bay of Fundy in Canada. Is this low or high tide?

Triple Junction, Rifting in East Africa

In this activity, we will fly around Earth looking at examples of plate boundaries before concentrating on the plate tectonic setting of East Africa. As we stop at each location, take the time to study the shape of the land and the types of distinguishing features. We will ask you to identify and characterize different plate boundaries and be able to relate them to tectonic forces and structures.

Using Fossils in Geologic Time

You will be acting as an intern for NPS with the task of creating interpretive signs to understand the role fossils play in geologic time. You will have reference materials at hand when you are asked to identify fossils and determine the type of environment they represent, to use the geologic time scale to locate different types of information and recognize the ages of different periods and epochs, and to apply relative dating principles to sequences of rock.

Water Pollution

Determine the location, type of water body, and primary contaminant with its source for specific water bodies.



Wind Power

In this activity, you will assume the role of a young adult talking to their mom, who is creating a brochure to promote wind energy. She wants to bounce her ideas off you, regarding her approach to wind energy development in the U.S. You will discuss which locations are best-suited for wind energy, and the benefits and challenges of wind energy.