EARTH SCIENCE ACTIVITY PACK

GEOLOGY AROUND YOU

How much of everyday life depends on geology?

Do not start with a list of geology facts. Start with the room around you. Pick an ordinary thing, ask what it is made from, and keep tracing backward until geology enters the story.

BEFORE YOU INVESTIGATE

How much of everyday life do you think depends on geology?

☐ a little ☐ some ☐ most ☐ almost everything

Give two examples you already suspect have a geological connection.

LOOK -> GUESS -> TRACE BACK -> DISCUSS -> REVISE

YOUR JOB

Ask where an ordinary material or resource came from **before** it became part of a building, phone, tap, heater or piece of jewellery.

YOUR EVIDENCE

Use what you can observe, labels, teacher information and reliable public sources. It is fine to write **unknown** and change your mind after discussion.

NON-DESTRUCTIVE ONLY

Do not scratch, chip, taste, heat, break, open or dismantle anything. Do not bring valuable jewellery to school.

INVESTIGATION 01

GEOLOGY IN PLAIN SIGHT

Start with the easiest connection: materials that are still recognizably natural rock. Search your school or home for stone used directly in the building.

POSSIBLE PLACES TO LOOK

Countertops, floors, stairs, window sills, wall cladding, roof tiles, memorial stones and decorative paving.

EXAMPLES, NOT A CHECKLIST

Granite, limestone, marble and slate are common building stones in some places. You may find none of them. Record what you actually observe.

FIND TWO POSSIBLE NATURAL STONES

Object / location	What do you observe?	What do you think it is?	Why?	Confidence

Discuss before you revise: What would convince you that the material is natural stone rather than a manufactured imitation?

After discussion, revise one identification if needed.

INVESTIGATION 02

WHEN GEOLOGY IS TRANSFORMED

Now look for materials that no longer resemble rocks. These are the objects that make the geological connection less obvious.

GLASS

Major raw material: silica-rich sand, commonly rich in quartz.

BRICK

Begins with clay-rich geological raw material, then is shaped and fired.

CONCRETE

Uses sand/gravel aggregate plus cement made from geological raw materials.

STEEL

Begins with iron ore. Hematite and magnetite are major iron minerals.

COPPER WIRING

Copper is extracted from copper-bearing ore deposits.

ALUMINIUM

Most aluminium is produced from bauxite, an important aluminium ore.

PICK ONE OBJECT AND TAKE IT APART ON PAPER

Phone, laptop, lamp, chair, bicycle, window, wall, cable or another ordinary object. Do not physically dismantle it.

Material in the object	My first guess: where did it come from?	After discussion: where geology enters the story	What changed?

IRON IS A POWERFUL EXAMPLE

Many major iron resources come from banded iron formations, ancient layered rocks that commonly contain hematite and/or magnetite. Iron is then processed into the steel that surrounds us.

INVESTIGATION 03

WHERE DOES YOUR WATER START?

Turn on a tap. The water has travelled through pipes, but the story started in the environment. Your task is to trace it back far enough to see where geology matters.

Tap water -> Water supply -> Environmental source

GROUNDWATER

Water can be stored in pores and fractures in rock or sediment and pumped from wells.

SURFACE WATER

Rivers, lakes and reservoirs are shaped by the landscape and geology of their catchments.

TRACE YOUR BUILDING'S WATER

My best starting claim: ☐ groundwater ☐ surface water ☐ mixed ☐ unknown

Question	What I found	Evidence / source
Where is the water collected?		
Where does geology affect the source or route?		
What changed after discussion?		

IF YOUR WATER SOURCE INCLUDES GROUNDWATER

Groundwater is stored in pores and fractures in soil, sediment and rock. **Porosity** describes how much space is available to hold water, while **permeability** describes how easily water moves through connected spaces. These properties can help explain how an aquifer stores and transmits groundwater.

In one sentence: why can a glass of tap water have a geological story?

INVESTIGATION 04

WHAT POWERS THIS BUILDING?

A light switch hides a long supply chain. Trace the building's electricity or heating backward to its original energy source, then ask where geology enters.

Coal	A geological fuel formed from ancient plant material altered during burial.
Oil / natural gas	Geological fuels formed from buried organic matter, commonly within sedimentary basins.
Nuclear	Uses uranium fuel. Uranium begins as a geological resource that must be found, mined and processed.
Geothermal	Uses heat from within Earth; local geology controls where useful heat and fluids can be accessed.
Wind / solar / hydro	The energy source is not geological, but turbines, cables, generators, panels and batteries still depend on mined materials.

TRACE TWO ENERGY USES

Energy use	Carrier / fuel	Original source, if known	Where does geology enter?

Discuss: Is electricity itself the source? Does renewable energy have no geological connection? Be ready to defend your answer.

After discussion, write one conclusion.

INVESTIGATION 05

OIL WITHOUT BURNING IT

Oil and natural gas are not used only as fuels. They are also feedstocks for petrochemicals that become many everyday materials.

PLASTICS

Many common plastics are made from petrochemical feedstocks derived from crude oil or natural gas. Some plastics use other feedstocks.

SYNTHETIC FIBRES

Polyester, nylon and other synthetic fibres are commonly made from petrochemical raw materials.

SYNTHETIC RUBBER

Many synthetic rubbers begin with petrochemical feedstocks, although natural rubber comes from plants.

ASPHALT / BITUMEN

Road asphalt commonly mixes mineral aggregate with bitumen, a petroleum-derived binder.

HUNT FOR THREE POSSIBLE OIL-DERIVED MATERIALS

Everyday item	Which material might be oil/gas-derived?	What evidence do you have?	Confidence after discussion

DO NOT OVERCLAIM

Not every plastic, fibre, rubber or coating has the same feedstock. Use words such as **many**, **often** or **may** unless you have product-specific evidence.

What surprised you most about using petroleum without burning it?

INVESTIGATION 06

GEOLOGY YOU WEAR

Finish with materials people choose for appearance, durability or value. Some are geological, some are processed metals, some are biological, and some are manufactured.

AMETHYST
A purple variety of quartz.

RUBY / SAPPHIRE
Gem varieties of the mineral corundum.

DIAMOND
Crystalline carbon formed naturally under particular geological conditions.

GOLD / SILVER
Metals obtained from geological deposits, then refined and commonly alloyed.

PEARL
Biogenic, produced by organisms; not a mineral.

LOOK-ALIKES
Glass and cubic zirconia can be manufactured gem materials.

CHOOSE TWO EXAMPLES

Use an item already present, a photograph or one of the examples above. Do not bring valuables or discuss price.

Item / example	What do you think it is?	Trace it back	Evidence	Did discussion change your view?

USEFUL IDEA

Gemstone describes use and value, not one scientific material type. A gem material can be a mineral, a rock, a biological material or a manufactured substitute.

Which example most clearly shows that “valuable” and “geological” are not the same thing?

FINAL INVESTIGATION

HOW GEOLOGICAL IS YOUR WORLD?

Return to the question from page 1. Choose eight ordinary things from your school, home or both and trace each back until you can say where geology enters the story.

Everyday thing	What is it made from / supplied by?	Where geology enters	Evidence

Before: I thought this much of everyday life depended on geology...

Now: I think this much of everyday life depends on geology...

Use at least three examples to explain how your thinking changed.

FINAL CLAIM

Geology is not literally everything around us, but it supplies, stores or controls a remarkable share of the materials and resources that everyday life depends on.