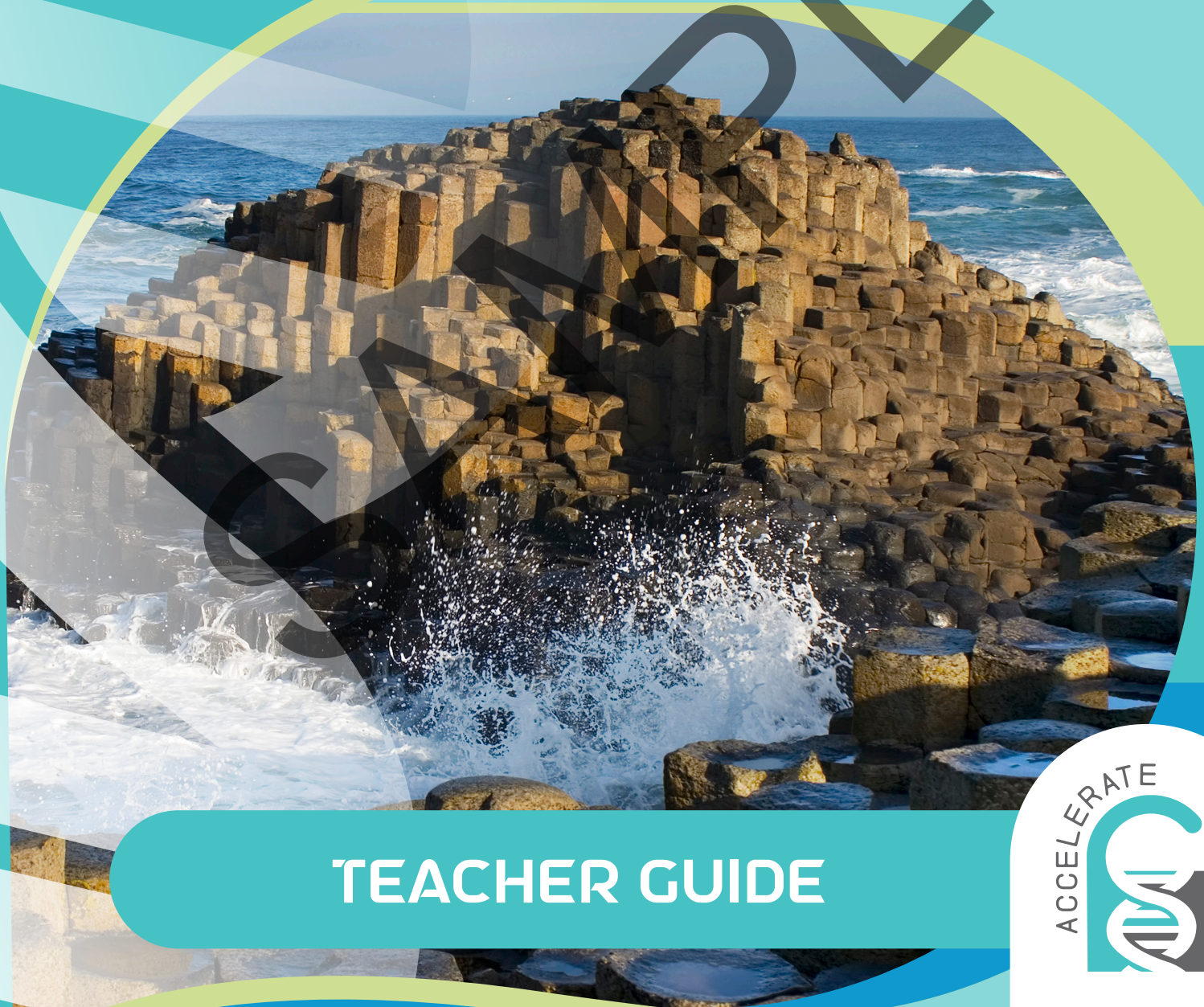


# ROCKS AND RESOURCES



TEACHER GUIDE

ACCELERATE



# PLANNING

Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time. Time required for each lesson may vary.

ACTIVITY INFORMATION	SECTION (S)	TIME REQUIRED	DAY/ LESSON
<b>ACTIVITY 1: SHAKING THE SOIL</b>  Explore what's inside the earth right around your house.  <b>Time required: 45 min</b>	<ul style="list-style-type: none"> <li>What's in the Tube?</li> </ul>	45 minutes	Day 1
<b>ACTIVITY 2: SETTLE DOWN</b>  Learn where soil comes from and how sedimentary rocks are formed.  <b>Time required: 1h 30 min</b>	<ul style="list-style-type: none"> <li>Break It Down</li> </ul>	90 minutes	Day 2
<b>ACTIVITY 3: DEEP UNDERGROUND</b>  Create models of igneous and metamorphic rock.  <b>Time required: 2h 30 min</b>	<ul style="list-style-type: none"> <li>Hot Rocks</li> </ul>	60 minutes	Day 3
	<ul style="list-style-type: none"> <li>Everything Changes</li> </ul>	90 minutes	Day 4
	<ul style="list-style-type: none"> <li>Show What You Know</li> </ul>		
<b>ACTIVITY 4: SPECIAL INGREDIENTS</b>  Explore more about minerals and natural resources.  <b>Time required: 2 h</b>	<ul style="list-style-type: none"> <li>Crystal Ingredients</li> </ul>	60 minutes	Day 5
	<ul style="list-style-type: none"> <li>Natural Resources</li> </ul>	60 minutes	Day 6
<b>ACTIVITY 5: ROCK CYCLE REVISITED</b>  Learn more about studying the earth and create a rock cycle presentation.  <b>Time required: 1 h 30 min</b>	<ul style="list-style-type: none"> <li>Show What You Know</li> </ul>	60 minutes	Day 7
	<ul style="list-style-type: none"> <li>Geology In and Around the Earth</li> </ul>	30 minutes	Day 8
<b>ACTIVITY 6: DIG DEEPER</b>  Use these extension activities to keep the learning going.  <b>Time required: 1+ h</b>	<ul style="list-style-type: none"> <li>Science Fair</li> </ul>	60+ minutes	Day 9
	<ul style="list-style-type: none"> <li>Growing Crystals</li> </ul>	45 minutes	Day 10
	<ul style="list-style-type: none"> <li>Rock Hunting</li> </ul>	60+ minutes	Day 11

**Total time: 9+ hours**

# 2

## activity

## SETTLE DOWN

In the previous activity, your student observed the soil separating into layers. Now they will investigate what it's made of, how geologists study the earth beneath our feet, and what they find down there.

### LEARNING GOALS:

- ✓ I can use evidence to show that the rock cycle changes the characteristics and composition of rock types.
- ✓ I can use evidence to explain how the uneven distribution of Earth's mineral, energy, and groundwater resources is the result of past and current geological processes.

2

## BREAK IT DOWN

### Crumbled Up

- The vocabulary term sediment is defined.
- The student should crush the items using the same force and number of hits. Help them determine the strength they need to crush the food.



### THINK ABOUT IT!

**? Question 1: Compare the size and shape of the small pieces of material. Did the M&Ms crumble differently than the cracker?**

**Answer:** The pieces of cracker are all small and some are very fine, like dust. The pieces of candy are different sizes and colors; the candy coating chips away and the chocolate is in larger chunks.

**How to Help:** *Encourage the student to crush the material into different size pieces, so there are sizes to compare and contrast.*

**? Question 2: How do you think these different materials would move and settle if you put them in water?**

**Answer:** The color from the M&Ms would wash away, the chocolate and candy may wash away if the water was warm, and the cracker would get mushy or soak up some water.

**How to Help:** *This is also optional for the student to predict in this question and then mix the material with water in the aluminum pie plate.*

### Soil Source

- The vocabulary terms erosion, geology, and weathering are defined.
- There are variations of weathering not explored in this kit. Mechanical weathering breaks up rocks typically by freezing and thawing that cracks rocks apart. Chemical weathering includes processes like rocks dissolving or oxidizing that change the structure of the rock. For more information on weathering and erosion, check out the Science Unlocked Launch® kit called Unusual Structures.



## REFLECT

**? Question 1: Think about the local soil sample you collected. Where do you think most of the material came from to make that soil?**

**Answer:** Most of the soil was sand and clay, which is sediment from rocks. This material is most likely from rocks in the area. Some of the bark and organic material came from local plants.

**How to Help:**

- *If your soil sample was taken near a body of water, then the soil may be from somewhere upstream.*
- *If your soil sample was taken from a garden or landscaped area, then the soil was likely brought in from another area that processes soil for plants.*

**? Question 2: What processes created the bits of sand, rock, and living material (from plants) in your soil? Explain how these processes were different for each material you found.**

**Answer:** Sand and clay were weathered by wind and water over time. The living material is broken down from plants and other organisms.

**How to Help:** *Organic material is broken down by decomposition through insects that live in the ground. Rocks and sand are broken down by weathering of wind and water.*

### Packed in Tight

3

- In this reading, your student will learn about the rock cycle and the formation of sedimentary rocks over a long period of time. The rock cycle will be addressed continuing into Activity 3.
- The vocabulary terms pressure, rock cycle, and sedimentary rock are defined.
- The process of creating sedimentary rocks described in this section is called lithification. This process involves the accumulation of sediment (deposition), squeezing the sediment and pressing out the moisture (compaction), and fusing the minerals and sediment together (cementation).



# GLOSSARY

**Aquifer** – an underground layer of rock and soil that is able to store groundwater.

**Crust** – the rocky outer layer of Earth.

**Erosion** – the movement of sediment from broken rocks.

**Geology** – the study of Earth's processes and what it's made of.

**Groundwater** – water found beneath Earth's surface.

**Human impact** – how the actions of people change the environment.

**Igneous rock** – a type of rock formed when magma reaches the Earth's surface and cools into a hardened form.

**Inner core** – the layer of the earth that is in the center of the earth, is made of solid metal and is responsible for heating the mantle and causing Earth's magnetic field.

**Magma** – melted rock beneath Earth's surface.

**Mantle** – the layer of the earth that is below the crust and above the outer core and is made of melted rock.

**Metamorphic rock** – a type of rock formed under high heat or intense pressure changes.

**Mineral** – a pure solid formed within the earth.

**Natural resource** – materials found in nature that can be used to make money.

**Nonrenewable resource** – natural resources that are not unlimited or will not restore at the speed in which they are used.

**Ore** – a naturally occurring metal or mineral that can be dug out of the earth.

**Outer core** – the layer of the earth that is between the mantle and inner core and is made of hot liquid metal.

**Pressure** – the force of something pressing against something else.

**Renewable resource** – natural resources that are unlimited or restore at the speed in which they are used.

**Rock** – a solid object made of one or more minerals.

**Rock cycle** – the processes on Earth that change rocks over time.

**Sediment** – material that is broken down by natural processes and moved by water or wind.

**Sedimentary rock** – a type of rock formed from broken down and eroded rocks.

**Soil** – the upper layer of earth that contains minerals, nutrients, and organic materials.

**Weathering** – the geological process of breaking down rocks into smaller pieces.

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Revision Date	8/2023