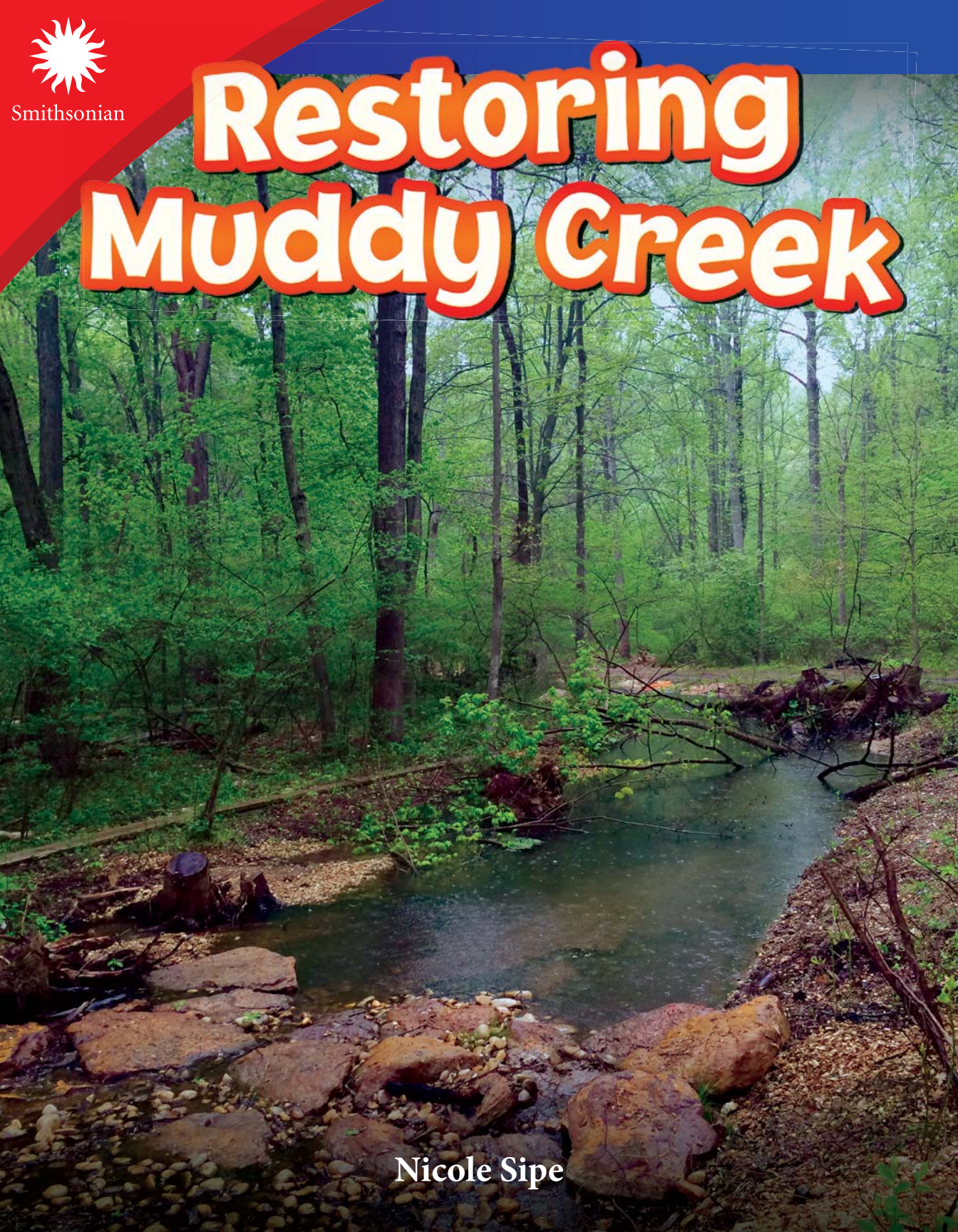
Smithsonian

Restoring Muddy Creek



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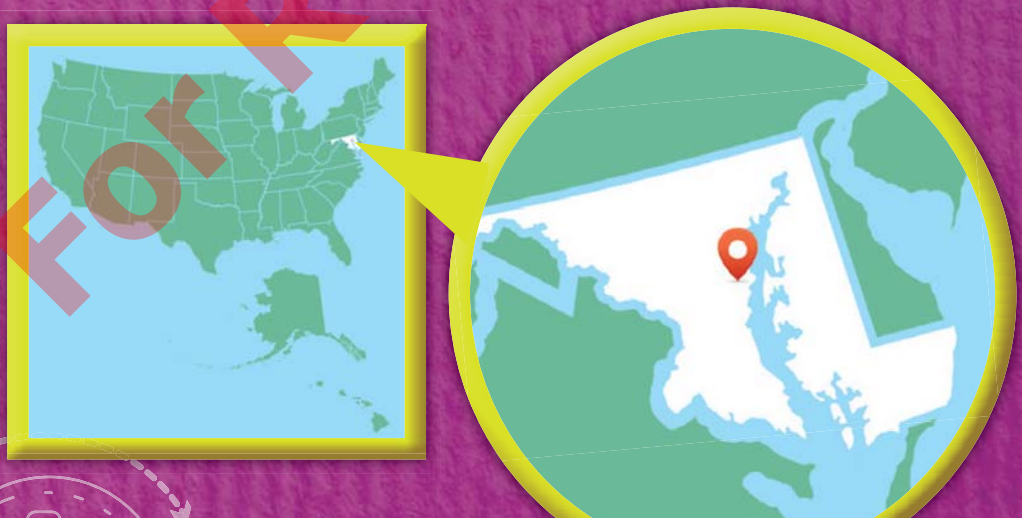
A Unique Creek

Creeks are important to living creatures. Many kinds of fish live in them. Insects lay eggs in them. Creeks are places where frogs make homes, birds take baths, and kids play on hot summer days. Without water sources like creeks, life could not survive.

One important body of water is called Muddy Creek. It is in Edgewater, Maryland. This small creek is important because it is the site of a major makeover. For a long time, Muddy Creek was out of balance. The land around the stream was worn down. This caused the water to flow faster when it rained a lot. Fast-moving water in a small stream is harmful. Fast water destroys the homes of the animals that live in and near it. It can also carry more **pollution** and waste with it. Muddy Creek was a mess for many years, until scientists set out to restore it.



Edgewater, Maryland, USA

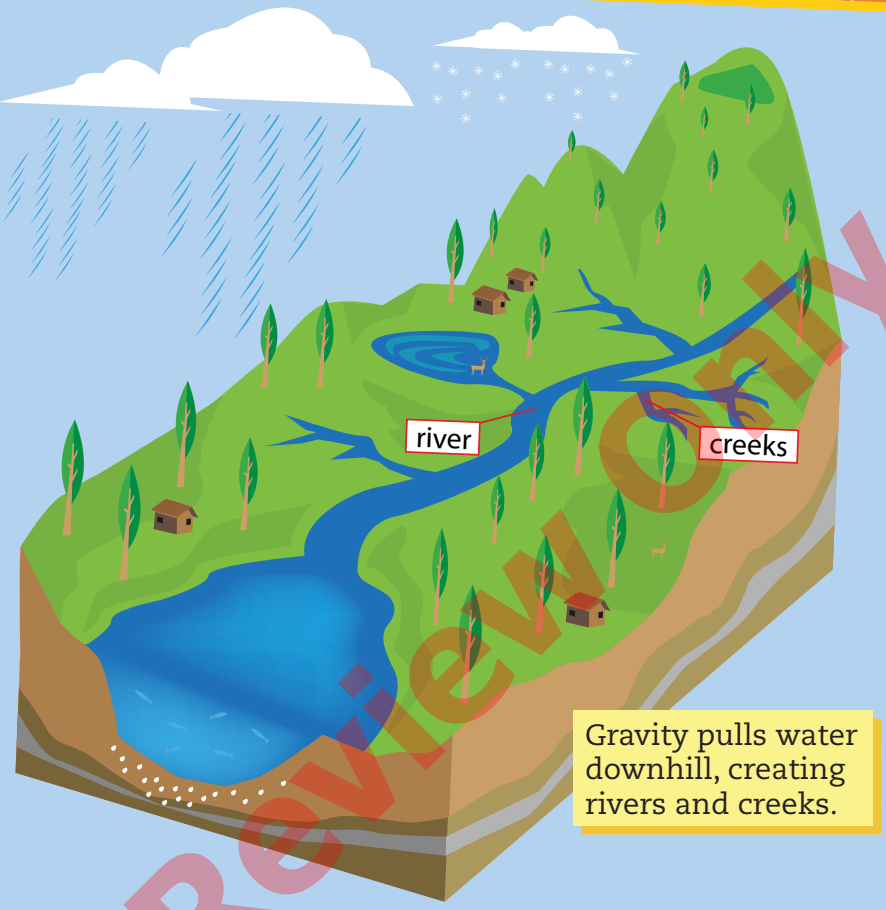
A scientist collects data at Muddy Creek.

Life Is But a Stream

Muddy Creek is a small stream but it has a big impact on nature. All the land on Earth is part of a watershed. Drop by drop, the water from rain and snow goes into the ground. It makes its way into creeks and rivers. Then, it ends up in the ocean. A change in even one small creek can affect an entire watershed.

To understand how important creeks are, think about your body. It is made up of veins and arteries that carry blood all around your body. Earth works in a similar way. But instead of veins and arteries, Earth has creeks and rivers that carry water all around the world. This water is needed by every living thing.

A river flows into the sea.



Gravity pulls water downhill, creating rivers and creeks.

SCIENCE

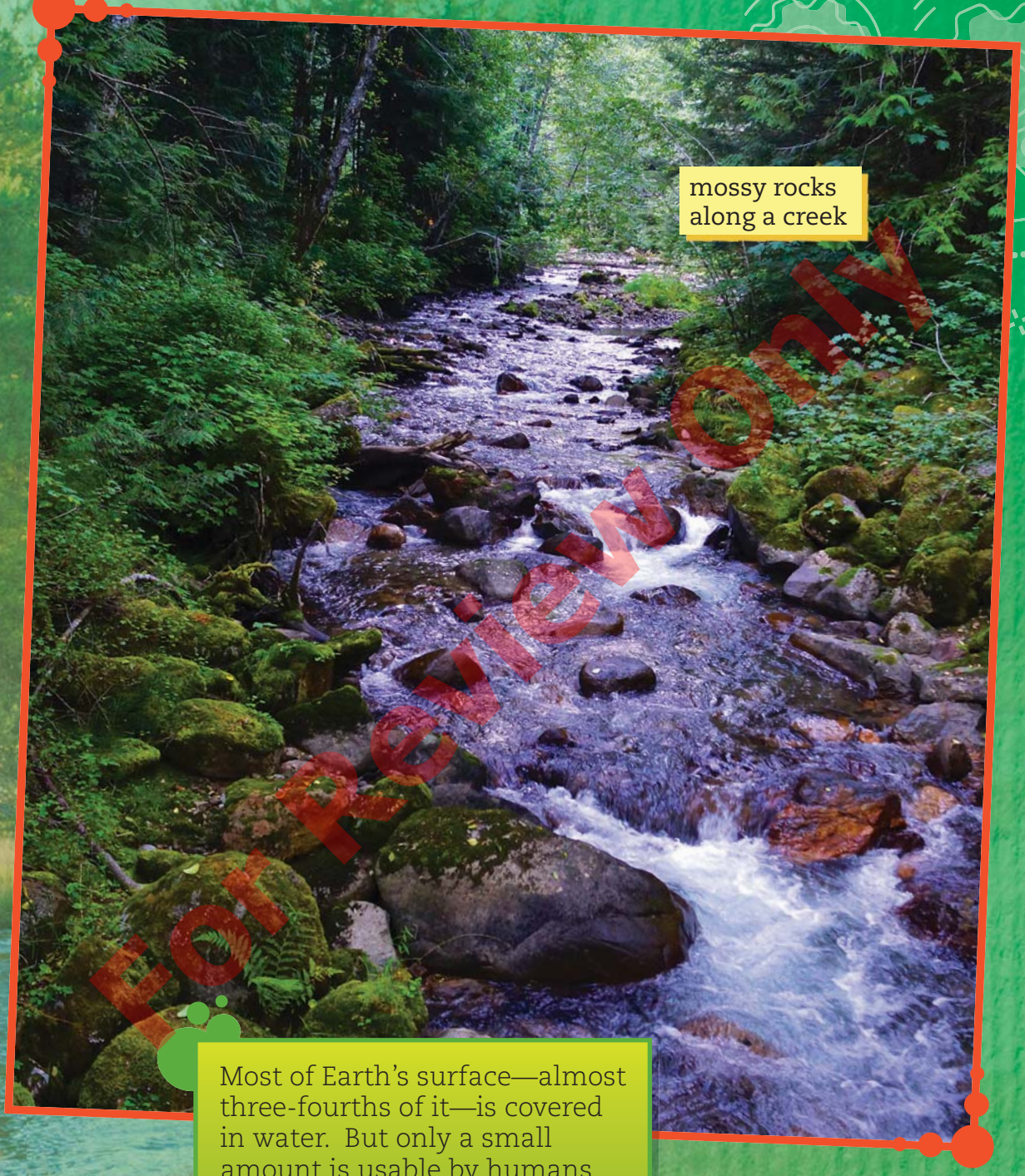
Pulling Water

When it rains or when snow melts, **gravity** pulls the water downhill. The land absorbs some water. The rest flows along the surface of the land. Rivers and streams are formed. They flow into larger bodies of water, such as lakes and oceans.

Waterways are important, so we want to take care of them. What does a natural creek look like? A natural creek bed does not follow a straight path. Instead, it has lots of twists and turns with deep and shallow pools. It has clear water and shady trees along the sides of the creek, called **banks**. A creek is home to many living things. You may see moss growing on rocks and plants growing along the bank. You may see frogs, fish, and flying insects. You may also spot birds and other animals at a creek.

An area with natural creeks and streams is also better prepared for floods. During heavy rain, water in a shallow creek will flow over the banks of the creek. This water soaks into the flat ground nearby. The nearby ground is called a **floodplain**. A creek needs a floodplain in order to stay in balance.

Ducks rely on creeks for food and water.



mossy rocks along a creek

Most of Earth's surface—almost three-fourths of it—is covered in water. But only a small amount is usable by humans.

STEAM CHALLENGE

Define the Problem

Now that you know how erosion changes a creek, what can you do to prevent it? Your first task is to build a creek with sand and soil on a flat surface, such as a lunch tray. Then, add materials in and around the creek to reduce erosion. Which materials will work best?

Constraints: Your model can only include three of these five materials: pebbles, mulch, moss, small bags of sand, and cardboard squares.

Criteria: Your design must decrease the amount of sediment washed away by $\frac{1}{2}$ liter (about 2 cups) of water poured through the creek.

Research and Brainstorm

What makes water in a creek change speed? How does erosion change a creek? What did scientists do to restore Muddy Creek?

Design and Build

Sketch your creek. Include where you will place the materials. Place the creek in a large box. Lift one side of the box 8 centimeters (3 inches). Pour water into the creek and collect the water and sediment as it flows out. Measure how much sediment is washed away. Add the materials in and around the creek.

Test and Improve

Pour water through the creek again with the materials in place. Is there more or less sediment? Was your design successful? How can you improve it? Modify the placement of the materials, and try again.

Reflect and Share

Did your design reduce erosion? How do you know? Compare your model to other models in the class. What can you learn from other models?