

On the first day of camp, Deb suggested a hike through the woods to the river. Steve and Anne were ready to go. Rocky raced back to his tent.

“Wait up while I grab my stuff,” he yelled. “We might find some great rocks.”

“He’s always collecting rocks,” laughed Steve. “That’s why everyone calls him Rocky. I don’t even know his real name.” The campers headed off down a path when Rocky returned. A hammer, knife and magnifying glass clinked together in his backpack as he walked.



“Wow! The water is much deeper this year,” said Anne, when the campers reached the **riverbank**.

“Wider, too,” said Steve. “Some of the trees are standing right in the water.”

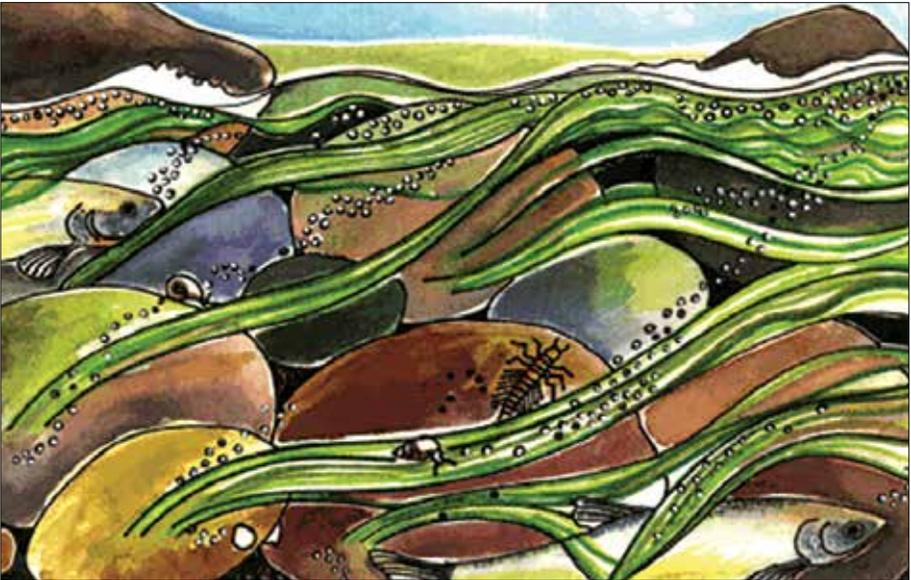
“It snowed so much last winter and rained so much this spring,” explained Deb. “Melting snow and ice in the mountain feed this river, and heavy rain feeds it more.”

“Check that out,” said Rocky, pointing to the steep bank on the far side of the river. “The water has washed away some soil. You can see tree roots along the edge of the bank.”

“Imagine what would have happened if no trees grew there,” said Deb. “Their roots wrap around soil, gravel and rocks to anchor the tree, and take in **nutrients** and water. They also help hold the riverbank in place.”

“The roots of all those bushes and grasses must help hold the bank, too,” said Anne.

“You bet,” said Deb, “and in turn, the riverbank is a good place for the bushes and grasses to grow. Like all plants, they need light, water, air and nutrients. The water carries and deposits nutrients, making the soil richer. The river cuts through the woods, letting in plenty of light. Plant leaves use sunlight to make food—a kind of sugar—from water and air.”



Rocky looked straight down into the water. “There’s green stuff on those stones at the bottom,” he said. “Do plants grow underwater, too?”

“Those are simple plants called **algae**,” said Deb. “They cling to stones and get their nutrients and air from the water.”

"There's a lot of algae here," said Steve.

Deb nodded. "Some kinds produce eggs to grow new plants or just break off parts and grow that way," she said. "It's good that algae spread so easily. My *Rivers Field Guide* says that thousands of kinds of **insects** feed on them."

"Then a lot of birds and fish feed on the insects," added Anne.



Just then, a **belted kingfisher** flew from a dead tree and dove right into the river. When it popped up, it was holding a small fish in its beak. The kingfisher flew back to its tree, banged the fish on the head, then swallowed it.

Deb smiled. "You see how our camp got its name," she said. "This river carries plenty of kingfisher food: little fish and big insects."



"If the kingfisher played rock music, it might catch even more fish," said Steve. The other campers looked puzzled.

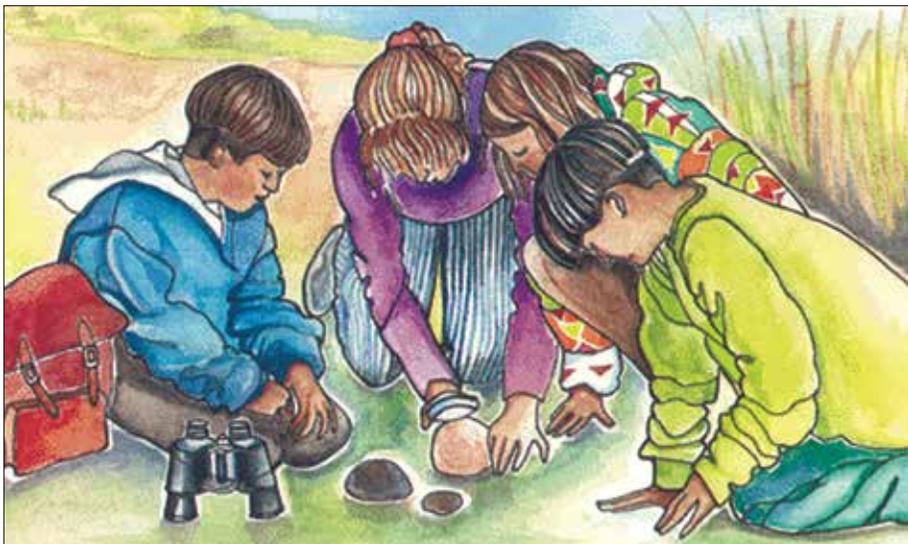
"I'll show you," he said, grabbing two rocks from the riverbank. He clicked them together underwater, then stayed very still. Nothing happened, so he played his rock music again.

To everyone's surprise, two small fish swam toward Steve. "See," he said. "**Sound** travels even better in water than in air. The fish came to see what was making the noise."

"Wow," said Anne, staring at the fish, "but where are their ears?"

"They don't have *outer* ears," said Deb, "but fish have *inner* ears—like we do. Their bones and the line along each side of their bodies pick up the sound **vibrations**."

“Hey, let me see those rocks,” said Rocky. “This one’s **sandstone**. Look. It’s made of grains of sand—mostly **quartz** sand stuck together with **iron**. The iron is what makes the rock brown. Sandstone with other **minerals** is usually white, red or yellow.”



He whipped out his magnifying glass so the campers could see the tiny grains of sand. Then he used his hammer to break off a piece of the rock. “Rub the broken edge,” he said.

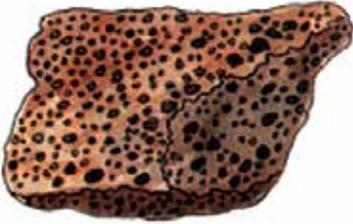
“The grains feel rough and sharp,” said Steve.

Rocky handed Anne his knife and asked her to scrape the sandstone. She scraped as hard as she could, but she couldn’t scratch the quartz in the rock. “Quartz is even harder than a knife blade,” Rocky explained.

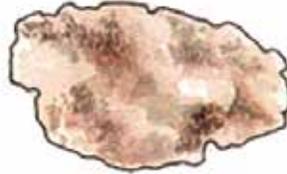
He tossed the rock and tools into his backpack. “Let’s see what else we can find.”



## ROCKY STARTS



lava



quartzite



coal

Scientists group rocks by the way they are formed. Heat inside Earth forms **igneous rocks**, such as **lava**. They cool slowly underground or blow out of volcanoes.

Moving water helps form **sedimentary rocks**, such as sandstone. The water deposits sand and gravel that minerals cement together as rocks. Sometimes pressure forms these rocks. **Coal** is a special sedimentary rock made from ancient plants under pressure.

Great heat or pressure changes igneous and sedimentary rocks to form **metamorphic rocks**. For example, sandstone can change into a stronger, tougher, smoother rock called **quartzite**.



## GRASS ALONG THE RIVER



Different kinds of grasses live in different kinds of ecosystems. **Reed canary grass** is one kind that lives along many rivers in the Pacific Northwest. It grows up to 1.5 metres (5 feet) tall. It produces long, thick clusters of flowers.

Some aboriginal people use the strong stems of reed canary grass to decorate their baskets. Others made grass mats and grass hats from the stems.

## **Nature Notes**

### **WHAT I DISCOVERED**

1. *Many rivers get water from rain, snow and ice.*
2. *Light, water, sand and gravel are non-living parts of the river ecosystem.*
3. *Trees, bushes and grasses live along the river. Their roots take in water and nutrients, and help hold the riverbank.*
4. *Many plants use light to make food from water and air.*
5. *Some algae live underwater. They break off parts or produce eggs to grow new plants.*
6. *Belted kingfishers eat fish and insects from rivers.*
7. *Fish can hear sounds underwater.*
8. *Some rivers help form sandstone, which is made of sand.*

### **THINGS TO CHECK LATER**

1. *How do algae cling to stones underwater?*
2. *What kind of fish does a belted kingfisher eat?*

