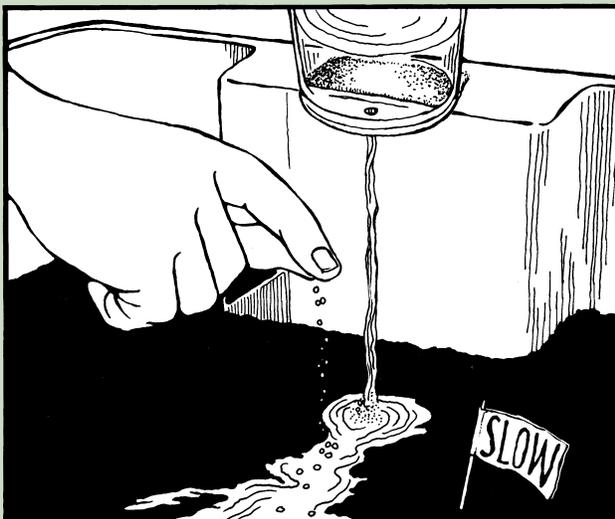


Student Instructions for Tracking the Movement of Soil

1. Bulldoze the land.
Attach the cup to the Velcro® on the stream table. Set up your stream table as shown in the illustration.
2. Slowly pour the water into your cup. Try to keep the water at the line. When a stream forms, place a “pinch” of marine sand in the stream near the cup. If the marine sand clumps, break it up gently with the tip of a toothpick.



3. Watch the marine sand move.
 - Place the flags marked *Slow* in areas where the stream is moving slowly.
 - Place the flags marked *Fast* in areas where the water is moving quickly. Stick the flags directly into the soil.

4. Continue to observe the speed of the stream and how soil is worn away (eroded) and dropped off (deposited) by the water. Talk with your group about what you observe.

5. When your bottle of water is empty and your stream is no longer running, look closely at your land.
 - Place the flags marked *Wears away soil* in places where soil was eroded by water.

 - Place the flag marked *Drops off soil* in one place where soil was deposited by water.

6. In your notebook, draw your stream table results. Label your drawing with the words *Fast*, *Slow*, *Wears away soil*, and *Drops off soil*.

7. Record observations in your notebook. Then try to answer the following questions:
 - How is the speed of the stream related to the way water erodes or deposits soil? Use evidence from your stream table to support your answer.

 - During a heavy rainstorm, what do you think would happen to the soil on a steep hill? Why do you think this would happen?

8. Clean up.
 - *Do not* tilt your stream table to drain extra water out of it.

 - Put the rubber stopper back in the drain hole.

 - *Do not* change the way your land looks. You will draw your stream in Lesson 8.

Reading Selection

Glaciers: Rivers of Ice

Have you ever seen a glacier? **Glaciers** are huge rivers of slowly moving ice that erode the land as they creep downhill. They form in cold, mountainous areas.

To learn more about glaciers, let's take an imaginary helicopter ride. We're heading for the mountains near the coast of Alaska. Fasten your seat belts. The gusty winds may give us a bumpy ride!

We will be flying over a **valley glacier**. This kind of glacier often flows in a V-shaped valley created by a river. On our way there, let's talk about how glaciers form.

Valley glaciers begin when snow collects on the sides of mountains. It never gets warm enough to completely melt the snow. Over the years, new snow falls. It becomes deeper. Sometimes the snow can get as high as two houses stacked together. When this happens, the snow is very heavy.

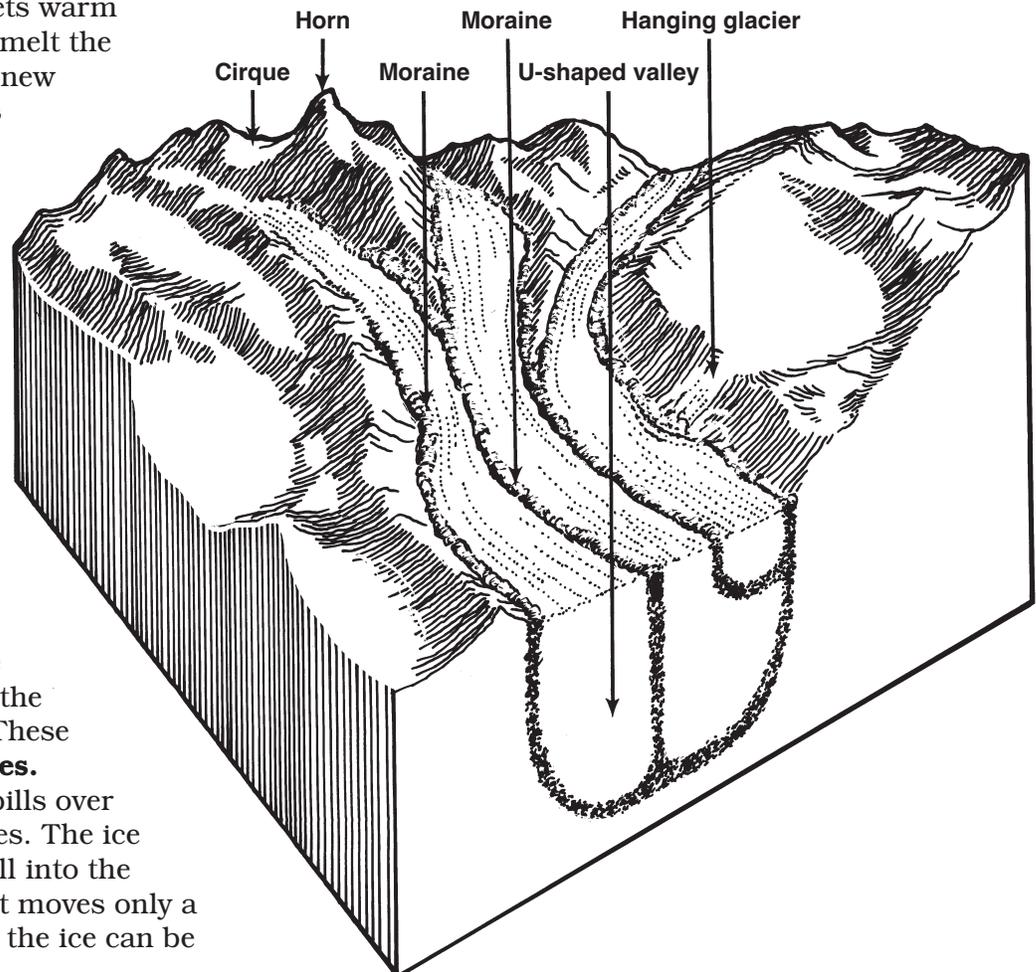
The weight of the snow presses the bottom layers of snow into ice. The ice crystals lock together. The ice is like rock. It is heavy enough to carve bowl-shaped holes in the sides of a mountain. These holes are called **cirques**.

Over time, the ice spills over the edges of the cirques. The ice begins to flow downhill into the valley below. Usually it moves only a few inches a day. Now the ice can be called a glacier.

Look ahead! Our helicopter has finally arrived at the glacier.

Do you see the sharp mountain peak at the head of the valley? This peak is called a **horn**. A horn forms when there are several cirques around a mountain. The ice in the cirques keeps wearing away at the mountain. The cirques get bigger. The mountain becomes pointed.

Now look at how several valley glaciers are coming together into one gigantic glacier. As the ice moves, it can stick to huge boulders and pull them up from the sides and floor of the valleys. Boulders stuck to the bottom of



the glacier can scour and erode the land. Some of these boulders may be bigger than your classroom. Beneath the ice, the valley is becoming wider and deeper. Now it has a U-shape.

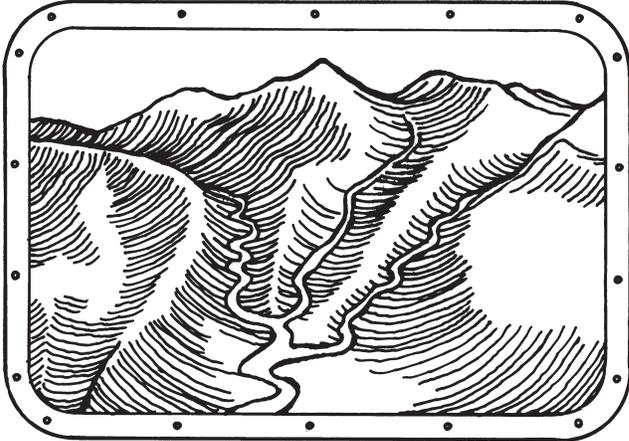
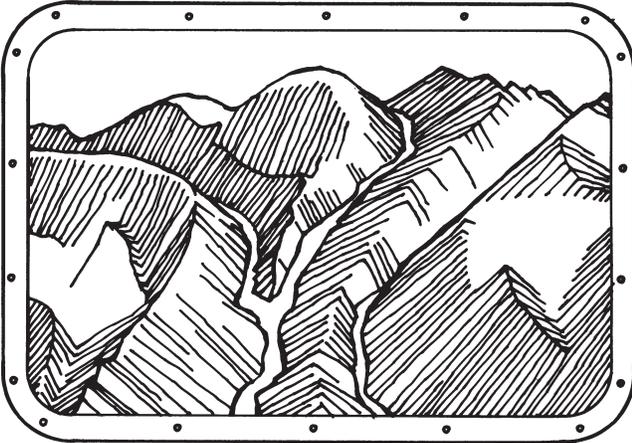
Let's drop our helicopter down and look more closely at the glacier. Do you see the chunks of rock deposited along the sides and front of the glacier? These deposits are called **moraines**. When two glaciers flow beside each other, they both deposit materials. A moraine forms between them.

Have you ever seen ice crack? Glaciers crack, too. Deep cracks in glaciers are called **crevasses**. Sometimes glaciers move over uneven land. The ice on top of the glacier bends and breaks. This is how crevasses form.

Now let's fly east. Can you see a smaller glacier plunging over a steep cliff? It is a **hanging glacier**. It is separate from the main glacier. Huge blocks of ice the size of railroad cars can break off.

Glaciers are always gaining and losing ice. High in the mountains in winter, new snow falls on the head of the glacier. Down lower, it is warmer. The front of the glacier can melt. Sometimes the glacier flows all the way to the sea. Giant blocks of ice break off and crash into the water. That's how **icebergs** form.

It's time to turn our helicopter around. Let's fly back to the coast. As we do, look out your window. Do you see the valleys below? Which one do you think was made by a river? Which one was made by a glacier?



V-shaped and U-shaped valleys through helicopter windows

After you get home, take a look at the land in your own area. Can you tell whether glaciers once flowed there?