Name: _____ Date: _____

How a Waterfall Slowly Walks Upstream

Circle group

A waterfall looks like a fixed part of the land, but many waterfalls are moving. Very slowly, over hundreds or thousands of years, they travel backward up the river.

The story begins with two kinds of rock. Picture a river that flows over a hard layer of rock. Under it is a layer of softer rock. At the edge, the river tumbles over the hard layer and drops onto the soft layer below. That edge is the waterfall.

At the bottom, the falling water swirls in a deep pool called a plunge pool. The water carries sand and small stones. It strikes the soft rock again and again and wears it away. Soon the soft rock under the hard layer is hollow. The hard rock above sticks out like a shelf.

A shelf with nothing under it cannot stay up forever. A piece of it cracks and breaks off. It falls into the pool. The edge of the waterfall is now a little farther upstream. Then the same thing happens again, and again.

Each step is tiny, but the steps add up. Over a very long time, a waterfall can carve a deep, narrow valley called a gorge behind it. A gorge below a waterfall is the trail the falls have left.

Questions

1. What two kinds of rock does a moving waterfall need?

_____

_____

2. What is a plunge pool?

_____

_____

3. What does the swirling water wear away?

_____

_____

4. What happens when the hard shelf has nothing under it?

_____

_____

5. Why is the waterfall farther upstream after the shelf breaks?

_____

_____

6. What is a gorge below a waterfall?

_____

_____

Words to know

plunge: to drop or fall suddenly
shelf: a flat piece that sticks out from a wall or cliff
gorge: a deep, narrow valley with steep rock walls

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

How a Waterfall Slowly Walks Upstream

Triangle group

A waterfall looks like a fixed part of the land, but many waterfalls are moving. Very slowly, over hundreds or thousands of years, they travel backward up the river that feeds them.

The story begins with two kinds of rock. Imagine a river that flows over a layer of hard rock that sits on top of a layer of softer rock. At the edge, the river tumbles over the hard layer and drops onto the soft layer below. That edge is the waterfall.

At the bottom, the falling water churns in a deep pool called a plunge pool. The swirling water, carrying sand and small stones, strikes the soft rock again and again and wears it away. Soon the soft rock under the hard layer is hollowed out, and the hard rock above is left hanging out like a shelf.

A shelf with nothing under it cannot stay up forever. Eventually a piece of it cracks and breaks off, and it falls into the pool. The edge of the waterfall is now a little farther upstream than before. The same thing then happens again, and again.

Each small step is tiny, but the steps add up. Over a very long time, a waterfall can carve out a deep, narrow valley called a gorge behind it. A gorge below a waterfall is the trail that the falls have left behind them.

Questions

1. What two kinds of rock are needed for a waterfall to move upstream?

_____

_____

2. What is a plunge pool?

_____

_____

3. What does the swirling water wear away?

_____

_____

4. What happens when the hard shelf has nothing under it?

_____

_____

5. Why does the waterfall end up farther upstream after the shelf breaks?

_____

_____

6. What is a gorge below a waterfall?

_____

_____

Words to know

plunge: to drop or fall suddenly
churns: stirs up and swirls with force
hollowed: made empty on the inside
shelf: a flat piece that sticks out from a wall or cliff
gorge: a deep, narrow valley with steep rock walls

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

How a Waterfall Slowly Walks Upstream

Square group

A waterfall appears to be a permanent feature of the landscape, yet many waterfalls are actually on the move. Extremely slowly, over hundreds or even thousands of years, they travel backward up the river that feeds them.

The story begins with two different kinds of rock. Imagine a river flowing across a layer of hard rock that rests on top of a layer of softer rock. At the edge, the river tumbles over the hard layer and drops onto the soft layer below, and that edge is the waterfall.

At the bottom, the falling water churns inside a deep basin called a plunge pool. The swirling water, loaded with sand and small stones, strikes the soft rock repeatedly and gradually wears it away. Before long, the soft rock beneath the hard layer is hollowed out, and the hard rock above is left jutting out like a shelf.

A shelf with nothing underneath it cannot remain in place forever. Eventually a section of it cracks and breaks away, plummeting into the pool. The edge of the waterfall is then located a little farther upstream than it was before, and the very same process begins again, and then again.

Each individual step is minuscule, but the steps accumulate. Over an immense span of time, a waterfall can carve a deep, narrow valley called a gorge behind it. A gorge below a waterfall is the trail that the falls have left behind them.

Questions

1. Which two kinds of rock does a moving waterfall require?

_____

_____

2. What is a plunge pool?

_____

_____

3. What does the swirling water gradually wear away?

_____

_____

4. What happens when the hard shelf has nothing underneath it?

_____

_____

5. Why is the edge of the waterfall farther upstream after the shelf breaks?

_____

_____

6. What does a gorge below a waterfall reveal?

_____

_____

Words to know

plunge: to drop or fall suddenly
churns: stirs up and swirls with force
hollowed: made empty on the inside
shelf: a flat piece that sticks out from a wall or cliff
gorge: a deep, narrow valley with steep rock walls

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: How a Waterfall Slowly Walks Upstream

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: How a Waterfall Slowly Walks Upstream

Easier · 212 words · Flesch-Kincaid grade 3.9

1. A hard rock layer on top of a softer rock layer.
2. The deep pool at the bottom where the water swirls.
3. The soft rock under the hard layer.
4. A piece cracks, breaks off and falls into the pool.
5. The edge is now where the rock broke off, farther back.
6. A deep, narrow valley that shows the path the falls took.

Triangle: How a Waterfall Slowly Walks Upstream

This passage · 230 words · Flesch-Kincaid grade 5.5

1. A hard rock layer on top of a softer rock layer.
2. The deep pool at the bottom where the falling water churns.
3. The soft rock under the hard layer.
4. A piece cracks and breaks off and falls into the pool.
5. The edge where the water drops is now where the rock broke off, farther back.
6. A deep, narrow valley that shows the path the falls have taken.

Square: How a Waterfall Slowly Walks Upstream

Harder · 240 words · Flesch-Kincaid grade 8.4

1. A hard rock layer resting on top of a softer rock layer.
2. The deep basin at the bottom where the falling water churns.
3. The soft rock beneath the hard layer.
4. A section cracks, breaks away and plummets into the pool.
5. The drop is now located where the rock broke away, farther back.
6. The path the falls have traveled over a very long time.