Name: _____ Date: _____

How Ice Splits Boulders and Breaks Roads

Circle group

Every winter, road crews fill potholes. Every spring, new ones appear. The cause is called frost wedging. It breaks mountain boulders the same way.

Water is odd. Most liquids shrink as they get colder. But when water freezes, it takes up more space. Ice is about one tenth bigger than the water it came from.

Picture a small crack in a rock or a road. After rain or snowmelt, water slips into the crack. When it gets below freezing, the water turns to ice and expands. The ice pushes on the walls of the crack with great force. The crack gets a little wider.

Then the day warms up and the ice melts. More water trickles deeper into the gap. At night it freezes again. This freezing and thawing can repeat hundreds of times in one winter. Slowly the crack becomes a split, and a chunk of rock or pavement pops loose.

In high mountains, frost wedging makes piles of broken stone called scree below cliffs.

Questions

1. What is the name of this kind of weathering?

_____

_____

2. What happens to water when it freezes?

_____

_____

3. How does water get into a crack?

_____

_____

4. Why does a crack get wider when ice forms?

_____

_____

5. Why is freezing and thawing so strong?

_____

_____

6. What are piles of broken stone below mountain cliffs called?

_____

_____

Words to know

expands: gets bigger or takes up more space
thawing: melting after being frozen
pavement: the hard surface of a road or sidewalk

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 Ice Splits Boulders and Breaks Roads

Triangle group

Every winter, road crews fill potholes. Every spring, new ones seem to appear. The cause is a pushy kind of weathering called frost wedging, and it works on mountain boulders the same way.

Water is strange. Most liquids shrink as they get colder, but water does something different at the very end. When it freezes, it takes up more space. Ice is about one tenth bigger than the water it came from.

Now picture a small crack in a rock or a road. After rain or snowmelt, water slips into the crack. When the temperature drops below freezing, that water turns to ice and expands. The ice pushes on the walls of the crack with great force, and the crack grows a little wider.

Then the day warms up, the ice melts, and more water trickles deeper into the widened gap. At night it freezes again. This cycle of freezing and thawing can repeat hundreds of times in a single winter. Slowly, the crack becomes a split, and a chunk of rock or pavement pops loose.

In high mountains, frost wedging makes piles of broken stone called scree on the slopes below cliffs.

Questions

1. What is the name of the weathering described in this passage?

_____

_____

2. What happens to water when it freezes?

_____

_____

3. How does water first get into a crack?

_____

_____

4. Why does a crack grow wider when ice forms in it?

_____

_____

5. Why is the cycle of freezing and thawing so powerful?

_____

_____

6. What do we call the piles of broken stone below mountain cliffs?

_____

_____

Words to know

weathering: the breaking down of rock by wind, water, ice or heat
expands: gets bigger or takes up more space
thawing: melting after being frozen
pavement: the hard surface of a road or sidewalk
cycle: a set of events that happens again and again

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 Ice Splits Boulders and Breaks Roads

Square group

Each winter, road crews patch potholes, and each spring, new ones seem to materialize. The culprit is a forceful kind of weathering known as frost wedging, and it operates on mountain boulders in precisely the same manner.

Water behaves unusually. Most liquids contract as they grow colder, but when water freezes, it occupies more space than it did as a liquid. Ice is roughly one tenth larger than the water from which it formed.

Now imagine a narrow crack in a rock or a road surface. After a rainstorm or a snowmelt, water slips into the crack. When the temperature falls below freezing, that water turns to ice and expands, pressing against the walls of the crack with tremendous force, and the crack widens slightly.

Then the day warms, the ice melts, and more water trickles deeper into the enlarged gap. At night it freezes once more. This cycle of freezing and thawing can repeat hundreds of times during a single winter. Gradually, the crack becomes a split, and a chunk of rock or pavement breaks loose.

In high mountains, frost wedging produces heaps of shattered stone called scree on the slopes beneath the cliffs.

Questions

1. What is the name of the kind of weathering described in this passage?

_____

_____

2. What happens to the size of water when it freezes?

_____

_____

3. How does water first find its way into a crack?

_____

_____

4. Why does a crack widen when ice forms inside it?

_____

_____

5. Why is the repeated cycle of freezing and thawing so powerful?

_____

_____

6. What name is given to heaps of shattered stone beneath mountain cliffs?

_____

_____

Words to know

weathering: the breaking down of rock by wind, water, ice or heat
expands: gets bigger or takes up more space
thawing: melting after being frozen
pavement: the hard surface of a road or sidewalk
cycle: a set of events that happens again and again

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 Ice Splits Boulders and Breaks Roads

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

Circle: How Ice Splits Boulders and Breaks Roads

Easier · 166 words · Flesch-Kincaid grade 3.2

1. Frost wedging.
2. It expands and takes up more space.
3. Through rain or snowmelt.
4. The ice pushes on the walls of the crack.
5. It repeats many times, and the crack grows each time.
6. Scree.

Triangle: How Ice Splits Boulders and Breaks Roads

This passage · 193 words · Flesch-Kincaid grade 4.9

1. Frost wedging.
2. It expands and takes up more space.
3. Through rain or snowmelt.
4. The ice pushes on the walls of the crack.
5. It repeats many times, and each time the crack gets a little deeper and wider.
6. Scree.

Square: How Ice Splits Boulders and Breaks Roads

Harder · 195 words · Flesch-Kincaid grade 7.3

1. Frost wedging.
2. It expands and takes up more space.
3. Through rainstorms or snowmelt.
4. The ice presses against the walls of the crack.
5. It happens hundreds of times, and each time the crack grows wider and deeper.
6. Scree.