Name: _____ Date: _____

Spending the Water Under Your Feet

Circle group

Under much of the ground you walk on, water hides in the spaces between grains of sand and gravel and in the cracks of rock. A layer that holds enough water to supply wells is called an aquifer. People in many places use aquifers for drinking water and for irrigating crops. How they use them raises a question about timing.

Rain and melting snow soak into the ground. They slowly move down until they reach the saturated zone, where every space is filled with water. The top of that zone is the water table. A well is a hole dug or drilled deep enough to reach below the water table. A pump brings the water up.

Aquifers refill, but often much more slowly than they are emptied. Water moves through sand and rock slowly. In some dry places, the water now being pumped fell as rain thousands of years ago. If a farm or a city takes water faster than rain can replace it, the water table drops. Wells must be drilled deeper. Pumps use more energy. Shallow wells may go dry. In some places, the ground itself sinks when water is removed from clay layers. That can damage roads and pipes, and it is hard to undo.

The fixes are practical. Farmers can switch to drip irrigation or to crops that need less water. Cities can fix leaking pipes and reuse treated wastewater. The water is out of sight, so the best tool is measurement. Monitoring wells let managers watch the water table rise and fall. Then they can tell if a town is spending its underground savings or only living on its income.

Questions

1. What is an aquifer?

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_____

2. What is the water table?

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3. What happens to the ground in some places when water is removed from clay layers?

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4. What can farmers and cities do to use less water?

_____

_____

5. Why do aquifers often refill more slowly than they are emptied?

_____

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6. What does it mean to spend underground savings instead of living on income?

_____

_____

Words to know

aquifer: a layer of rock or sand underground that holds water
water table: the top of the ground that is completely filled with water
saturated: completely soaked, holding as much water as it can
irrigating: bringing water to crops through pipes or ditches
monitoring: watching and measuring something over time

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: _____

Spending the Water Under Your Feet

Triangle group

Under much of the ground you walk on, water hides in the spaces between grains of sand and gravel and in the cracks of rock. A layer that holds enough water to supply wells is called an aquifer. People in many regions rely on aquifers for drinking water and for irrigating crops, and the way they are used raises a question about timing.

Rain and melting snow soak into the ground and slowly move downward until they reach the saturated zone, where every space is filled with water. The top of that zone is the water table. A well is simply a hole dug or drilled deep enough to reach below the water table, and a pump brings the water to the surface.

Aquifers refill, but often far more slowly than they are emptied. Water moves through sand and rock at a gentle pace, and in some dry regions the water now being pumped fell as rain thousands of years ago. If a farm or a city draws water faster than rain can replace it, the water table drops. Wells must be drilled deeper, pumps use more energy, and shallow wells may go dry. In some places, the ground itself sinks as water is removed from clay layers, a change that can damage roads and pipes and cannot easily be undone.

The remedies are practical. Farmers can switch to drip irrigation or crops that need less water. Cities can fix leaking pipes and reuse treated wastewater. Because the water lies out of sight, the best tool is measurement. Monitoring wells let managers watch the water table rise and fall, so they can tell whether a community is spending its underground savings or only living on its income.

Questions

1. What is an aquifer?

_____

_____

2. What is the water table?

_____

_____

3. What happens to the ground in some places when water is removed from clay layers?

_____

_____

4. What changes can farmers and cities make to use less water?

_____

_____

5. Why do aquifers often refill more slowly than they are emptied?

_____

_____

6. What does it mean to spend underground savings instead of living on income?

_____

_____

Words to know

aquifer: a layer of rock or sand underground that holds water
water table: the top of the ground that is completely filled with water
saturated: completely soaked, holding as much water as it can
irrigating: bringing water to crops through pipes or ditches
monitoring: watching and measuring something over time

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: _____

Spending the Water Under Your Feet

Square group

Beneath much of the ground on which we walk, water hides in the spaces between grains of sand and gravel and in the cracks of solid rock. A layer that holds enough water to supply wells is called an aquifer. People in many regions rely on aquifers for drinking water and for irrigating their crops, and the manner in which they are used raises an important question about timing.

Rain and melting snow soak into the ground and slowly travel downward until they reach the saturated zone, where every available space is filled with water. The upper surface of that zone is called the water table. A well is simply a hole that has been dug or drilled deeply enough to reach below the water table, and a pump then brings the water up to the surface.

Aquifers do refill, but frequently far more slowly than they are emptied. Water moves through sand and rock at a very gentle pace, and in some dry regions the water that is now being pumped fell as rain thousands of years ago. If a farm or a city draws water faster than rain can replace it, the water table begins to drop. Wells must be drilled deeper, pumps consume more energy, and shallow wells may go dry. In certain places, the ground itself sinks as water is removed from clay layers, a change that can damage roads and pipes and cannot easily be reversed.

The remedies are practical ones. Farmers can switch to drip irrigation or to crops that require less water, and cities can repair leaking pipes and reuse treated wastewater. Because the water lies hidden from view, the most valuable tool is measurement. Monitoring wells allow managers to watch the water table rise and fall, so that they can judge whether a community is spending its underground savings or merely living on its income.

Questions

1. What is an aquifer?

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2. What is the water table?

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_____

3. What happens to the ground in certain places when water is removed from clay layers?

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4. What changes can farmers and cities make in order to use less water?

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_____

5. Why do aquifers frequently refill far more slowly than they are emptied?

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_____

6. What does it mean for a community to spend its underground savings instead of living on its income?

_____

_____

Words to know

aquifer: a layer of rock or sand underground that holds water
water table: the top of the ground that is completely filled with water
saturated: completely soaked, holding as much water as it can
irrigating: bringing water to crops through pipes or ditches
monitoring: watching and measuring something over time

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: Spending the Water Under Your Feet

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

Circle: Spending the Water Under Your Feet

Easier · 275 words · Flesch-Kincaid grade 5.1

1. A layer of sand, gravel, or rock that holds enough water to supply wells.
2. The top of the saturated zone, where every space in the ground is filled with water.
3. The ground itself sinks.
4. Farmers can use drip irrigation or crops that need less water, and cities can fix leaking pipes and reuse treated wastewater.
5. Water moves slowly through sand and rock, and some of it fell as rain thousands of years ago.
6. It means using water faster than rain and snow can replace it.

Triangle: Spending the Water Under Your Feet

This passage · 287 words · Flesch-Kincaid grade 8

1. A layer of sand, gravel, or rock that holds enough water to supply wells.
2. The top of the saturated zone, where every space in the ground is filled with water.
3. The ground itself sinks.
4. Farmers can use drip irrigation or crops that need less water, and cities can fix leaking pipes and reuse treated wastewater.
5. Water moves through sand and rock at a gentle pace, and some of it fell as rain thousands of years ago.
6. It means using water faster than rain and snow can replace it.

Square: Spending the Water Under Your Feet

Harder · 313 words · Flesch-Kincaid grade 9.6

1. A layer of sand, gravel, or rock that holds enough water to supply wells.
2. The upper surface of the saturated zone, where every space in the ground is filled with water.
3. The ground itself sinks.
4. Farmers can use drip irrigation or crops that require less water, and cities can repair leaking pipes and reuse treated wastewater.
5. Water moves through sand and rock at a gentle pace, and some of it fell as rain thousands of years ago.
6. It means using water faster than rain and snow can replace it.