Name: _____ Date: _____

The Spiral Pump That Lifts Water Uphill

Circle group

Water runs downhill. To lift it, you need a machine. One old machine is the screw pump. It is named after Archimedes, a thinker from ancient Greece. It looks like a big screw inside a long tube.

A wide ridge winds around a center shaft. The shaft sits in a tube that leans a bit. The low end of the tube is in the water. A person turns a handle at the top. The screw spins in the tube.

Water slips into the bottom of the spiral. It cannot slide back out. Each turn of the ridge makes a small pocket, and the pocket holds the water. The pockets move up the shaft with the water inside. At the top, the water pours out into a channel.

Farmers used these machines to water their crops. Today, bigger ones help drain flooded land. Some carry grain, not water. A spiral that lifts things is a very old idea.

Questions

1. Where does the low end of the tube sit?

_____

_____

2. What do you turn at the top?

_____

_____

3. What happens to the water at the top?

_____

_____

4. What does each turn of the ridge make?

_____

_____

5. Why does the water stay in the screw and not slide back down?

_____

_____

6. Why would a farmer use a screw pump by a low ditch?

_____

_____

Words to know

spiral: a shape that winds around and around
shaft: a long rod in the middle of a machine
ridge: a raised line along a surface
drain: to let water flow away

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: _____

The Spiral Pump That Lifts Water Uphill

Triangle group

Water normally runs downhill, so lifting it takes some kind of machine. One of the oldest is the screw pump, often named after Archimedes, an ancient Greek thinker. It looks like a giant screw hidden inside a long tube, and it can raise water from a low ditch to a higher field.

The design is simple. A wide spiral ridge winds around a central shaft, and the shaft rests in a tilted tube. The lower end of the tube sits in the water. When a person turns a handle at the top, the whole screw spins inside the tube.

As the screw turns, water slips into the bottom of the spiral. The water cannot slide back out, because each turn of the ridge forms a small pocket that holds it. The pockets seem to travel upward along the shaft, carrying their water with them. At the top, the water pours out into a channel.

Farmers used machines like this to move water for their crops. Today, bigger versions help drain flooded land and move water at treatment plants. Some similar machines carry grain or soil instead of water. The idea of a spiral that lifts things has lasted for a very long time.

Questions

1. Where does the lower end of the tube sit?

_____

_____

2. What do you turn at the top to spin the screw?

_____

_____

3. What happens to the water when it reaches the top?

_____

_____

4. What does each turn of the ridge form that holds the water?

_____

_____

5. Why does the water not slide back down as the screw turns?

_____

_____

6. Why might a farmer want a screw pump near a low ditch?

_____

_____

Words to know

spiral: a shape that winds around and around
shaft: a long rod in the middle of a machine
tilted: leaning to one side, not straight up
ridge: a raised line along a surface
drain: to let water flow away

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: _____

The Spiral Pump That Lifts Water Uphill

Square group

Water naturally flows downhill, so raising it to a higher place requires some kind of machine. Among the oldest is the screw pump, frequently named after Archimedes, an ancient Greek thinker. It resembles an enormous screw concealed inside a long tube, and it can carry water from a low ditch up to a higher field.

The design is surprisingly simple. A broad spiral ridge winds around a central shaft, and the shaft rests inside a tilted tube whose lower end sits in the water. When a person turns a handle at the top, the entire screw spins within the tube.

As the screw rotates, water slips into the bottom of the spiral. It cannot slide back out, because every turn of the ridge forms a small pocket that traps it. The pockets appear to travel upward along the shaft, carrying their water along with them, and at the top the water pours out into a channel.

Farmers once relied on machines like this to move water to their crops. Today, much larger versions help drain flooded land and move water at treatment plants, and some similar machines carry grain or soil instead. The notion of a spiral that lifts things has endured for a very long time.

Questions

1. Where does the lower end of the tilted tube sit?

_____

_____

2. What does a person turn at the top to spin the screw?

_____

_____

3. What happens to the water once it reaches the top?

_____

_____

4. What does each turn of the ridge form that traps the water?

_____

_____

5. Why does the water fail to slide back down as the screw rotates?

_____

_____

6. Why might a farmer want a screw pump beside a low ditch?

_____

_____

Words to know

spiral: a shape that winds around and around
shaft: a long rod in the middle of a machine
tilted: leaning to one side, not straight up
ridge: a raised line along a surface
drain: to let water flow away

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: The Spiral Pump That Lifts Water Uphill

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

Circle: The Spiral Pump That Lifts Water Uphill

Easier · 157 words · Flesch-Kincaid grade 2.4

1. In the water.
2. A handle.
3. It pours out into a channel.
4. A small pocket.
5. The pockets hold it and carry it up.
6. It could lift the ditch water up to the fields.

Triangle: The Spiral Pump That Lifts Water Uphill

This passage · 203 words · Flesch-Kincaid grade 5.3

1. In the water.
2. A handle.
3. It pours out into a channel.
4. A small pocket.
5. The pockets between the ridges hold it and carry it upward.
6. It could lift the ditch water up to the higher fields where crops grow.

Square: The Spiral Pump That Lifts Water Uphill

Harder · 207 words · Flesch-Kincaid grade 7.7

1. In the water.
2. A handle.
3. It pours out into a channel.
4. A small pocket.
5. The pockets between the ridges trap it and carry it upward.
6. It could raise the ditch water to the higher fields where crops grow.