Name: _____ Date: _____

# A Staircase of Water for Boats

Circle group

A boat cannot climb a hill. But a canal lock can lift it. A lock is a short part of a canal with a gate at each end. It is like an elevator made of water.

A boat goes uphill on a canal. It floats into the lock at the low end. The gate shuts behind it.

Workers open small openings in the upper gate. Water flows in from the high part of the canal. The water rises, and the boat rises with it. Nothing pushes the boat. Gravity pulls the water in.

When the water inside is as high as the water past the upper gate, it stops. The upper gate opens. The boat floats out.

To go downhill, the steps run backward. Water drains out, and the boat sinks. On a steep slope, builders put several locks in a row, like stairs.

## Questions

**1. What is a canal lock?**

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**2. What happens after the boat floats in?**

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_____

**3. What force pulls the water into the lock?**

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_____

**4. When does the water stop flowing?**

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_____

**5. What must happen to the water for a boat to go downhill?**

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**6. Why do builders put several locks in a row on a steep slope?**

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_____

## Words to know

lock: a section of a canal where water is raised or lowered to move boats
canal: a waterway dug by people so that boats can travel
gravity: the force that pulls things down toward the ground
drains: flows out slowly until nothing is left

## 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: _____

# A Staircase of Water for Boats

Triangle group

A boat cannot climb a hill, but a canal lock can lift it up one. A lock is a short, walled section of a canal with a gate at each end. It works like an elevator made of water.

Say a boat is traveling uphill on a canal. First, it floats into the lock through an open gate at the low end. The gate closes behind it. Now the boat is inside a box with water on all sides.

Next, workers open small openings in the upper gate. Water from the higher stretch of the canal flows into the lock. Slowly the water rises, and the boat rises with it. Nothing needs to push the boat. Gravity pulls the water in, and the water does the lifting.

When the water inside the lock is as high as the water beyond the upper gate, the flow stops. The upper gate swings open and the boat floats out onto the higher stretch of the canal.

To go downhill, the steps run backward. The boat enters the lock at the top. Water drains out, and the boat sinks gently down to the lower level. Where a canal must climb a steep slope, several locks are built in a row, like steps on a staircase.

## Questions

**1. What is a canal lock?**

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**2. What happens right after the boat floats into the lock?**

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**3. What force pulls the water into the lock?**

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**4. When does the flow of water stop?**

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**5. What must happen to the water for a boat to go downhill?**

_____

**6. Why do builders put several locks in a row on a steep slope?**

## Words to know

lock: a section of a canal where water is raised or lowered to move boats
canal: a waterway dug by people so that boats can travel
gravity: the force that pulls things down toward the ground
stretch: a long piece of land or water
drains: flows out slowly until nothing is left

## 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: _____

# A Staircase of Water for Boats

Square group

A boat cannot climb a hill on its own, but a canal lock can lift it up one. A lock is a short, walled section of a canal with a gate at each end, and it works like an elevator made entirely of water.

Suppose a boat is traveling uphill along a canal. First, it floats into the lock through an open gate at the low end, and the gate closes behind it. Now the boat sits inside a walled chamber with water on all sides.

Next, workers open small openings in the upper gate, and water from the higher stretch of the canal pours into the lock. Gradually the water level climbs, and the boat climbs with it. Nothing has to push the boat upward, because gravity pulls the water in, and the water does all of the lifting.

When the water inside the lock reaches the same height as the water beyond the upper gate, the flow stops. The upper gate swings open, and the boat floats out onto the higher stretch of the canal.

To travel downhill, the steps run in reverse. The boat enters the lock at the top, the water drains out, and the boat sinks gently to the lower level. Where a canal must climb a steep slope, several locks are built in a row, like the steps of a staircase.

## Questions

**1. What is a canal lock?**

_____

_____

**2. What happens right after the boat floats into the lock?**

_____

_____

**3. What force pulls the water into the lock?**

_____

_____

**4. When does the flow of water stop?**

_____

_____

**5. What must happen to the water for a boat to travel downhill?**

_____

_____

**6. Why are several locks built in a row on a steep slope?**

_____

_____

## Words to know

lock: a section of a canal where water is raised or lowered to move boats
canal: a waterway dug by people so that boats can travel
gravity: the force that pulls things down toward the ground
stretch: a long piece of land or water
drains: flows out slowly until nothing is left

## 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: A Staircase of Water for Boats

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

### Circle: A Staircase of Water for Boats

Easier · 144 words · Flesch-Kincaid grade 2.4

1. A short part of a canal with a gate at each end.
2. The gate shuts behind it.
3. Gravity.
4. When it is as high as the water past the upper gate.
5. The water drains out and the boat sinks.
6. One lock lifts a boat a little. Several lift it step by step.

### Triangle: A Staircase of Water for Boats

This passage · 211 words · Flesch-Kincaid grade 4

1. A short, walled part of a canal with a gate at each end.
2. The gate closes behind it.
3. Gravity.
4. When the water in the lock is as high as the water beyond the upper gate.
5. The water drains out and the boat sinks to the lower level.
6. One lock lifts a boat only a little way. Several locks lift it a step at a time, like a staircase.

### Square: A Staircase of Water for Boats

Harder · 227 words · Flesch-Kincaid grade 6.6

1. A short, walled section of a canal with a gate at each end.
2. The gate closes behind it.
3. Gravity.
4. When the water inside the lock reaches the same height as the water beyond the upper gate.
5. The water drains out and the boat sinks gently to the lower level.
6. A single lock raises a boat only a short way, so several locks raise it one step at a time, like a staircase.