

How a Canal Lock Works

Name: _____

Read the passage all the way through before you start.

A canal is a river people built. The trouble with building a river is that land is rarely flat, and water cannot climb. A lock is the solution: a way of lifting a boat uphill using nothing but water and gravity.

A lock is a chamber with a gate at each end. Picture a boat arriving at the low side. The lower gate opens, the boat moves in, and the gate shuts behind it. The boat is now sealed in a stone box.

Now the lock keeper opens small valves in the upper gate. Water from the higher stretch of canal flows into the chamber. It cannot flow out, so the level rises — and the boat rises with it, floating the whole time. When the water in the chamber matches the level above, the upper gate can be swung open, because there is no longer any difference in pressure pushing against it.

The boat motors out onto the higher stretch, several metres above where it started. Going the other way, the whole process runs in reverse: water is let out, and the boat settles down to the lower level.

No pump is involved. No engine lifts anything. The only energy used is the weight of water that was already upstream, and it works exactly as well today as it did in the seventeenth century. A flight of locks can raise a boat the height of a ten-storey building, one chamber at a time.

Non-fiction · 244 words

Before you turn over

1. Underline any word you are not sure of. Work out what you can from the sentence around it.

2. In one sentence, what is this passage about?

3. Write down one question you still have.

The questions are on the next page. →

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Answer in complete sentences. Look back at the passage as often as you need to.

1. In your own words, what problem does a lock solve?

2. Put the steps in order for a boat going uphill.

3. Why can the upper gate only open once the levels match?

4. The writer says "a canal is a river people built". Why open that way?

5. What point is the writer making in the last paragraph?

How a Canal Lock Works — Answer Key

1. Boats cannot travel up or down a slope, but canals have to cross land that is not flat. A lock lifts or lowers the boat between two levels. *(Main idea)*
2. Lower gate opens; boat enters; lower gate shuts; valves in the upper gate open; water flows in and the boat rises; upper gate opens; boat leaves. *(Sequence)*
3. Until then the deeper water on the far side presses against the gate. When both sides are level there is no pressure difference holding it shut. *(Cause and effect)*
4. Answers will vary. It explains an unfamiliar thing using a familiar one, and it sets up the problem — real rivers run downhill on their own, built ones must be managed. *(Author's craft)*
5. That the design is efficient and enduring: it uses only gravity and water that is already there, and it still works after four hundred years. *(Author's purpose)*