

The Fish Mouth and the Bottleneck

PASSAGE · NON-FICTION

SKILLS TRAINED

Working memory

Delayed recall

Critical analysis

HOW TO USE THIS SHEET

About 20 minutes

- 1 Read the passage twice, slowly. Take about six minutes.
- 2 Turn to the next page and cover this one. No looking back.
- 3 Write what you remember, then mark it on the last page.

Every spring the Min River comes down out of the mountains of Sichuan carrying meltwater, grit and a bad temper. For centuries it did two things to the plain below, and neither of them was any use to the people farming there. In wet years it burst its banks and drowned the fields; in dry years it left the soil cracked and the crops dead.

In about 256 BC a governor named Li Bing arrived with an idea that was unusual then and is still unusual now. He would not try to stop the river. Other engineers of his age built dams and walls and waited to see which would give way first. Li Bing decided to divide the water instead, and let the river do the work of carrying itself away.

His first structure sits out in midstream and is shaped, roughly, like the snout of a fish. The Fish Mouth levee splits the Min into two channels. The outer channel keeps the old course and takes the flood. The inner channel was cut deeper and narrower, and it carries water towards the farmland. Because its bed lies lower, it draws the larger share in dry weather — about six parts in ten. In flood, when the river runs high and fast, the proportions reverse and most of the surge pours down the outer channel instead.

The second structure solves a quieter problem: grit. A river heavy with sand will choke any canal you pour it into. Where the inner channel curves, the water spins, the heavier sediment is flung to the outside of the bend, and a long low section of wall called the Flying Sand Weir lets it spill back out. Most of the sand never reaches the fields at all.

The third structure is a gap. To reach the plain, the inner channel had to pass through a ridge of hard rock on Mount Yulei, and Li Bing's workers had no iron tools equal to it and no explosives whatsoever. So they lit fires against the rock face, threw cold water on the hot stone until it cracked, and prised the pieces out. The gap took eight years to open. It is called Bottleneck Channel, and it is narrow deliberately: however violent the river becomes upstream, only so much of it can squeeze through.

Nothing in the system is sealed or permanent. The embankments were built from long woven bamboo baskets packed with river stones, which flex and settle under the current rather than shattering against it. Every winter the channels were dredged and the worn

baskets replaced, and a festival each spring still marks the morning the water is let back through.

Dujiangyan, as the whole arrangement is known, has been working for more than two thousand two hundred years. It waters the Chengdu plain, which feeds many millions of people, and it has been enlarged and repaired in every century since without its basic plan being changed. In 2008 a severe earthquake struck the area and brought down modern concrete buildings within sight of the weir; the ancient waterworks kept running. UNESCO added the site to its World Heritage list in 2000.

Visitors who expect something enormous are usually disappointed for the first few minutes. There is no great wall of masonry and no reservoir. There is only a river, parting around a stone snout, and going quietly where it is told.

- 5 Why does the writer finish by saying that visitors are usually disappointed at first?

- 6 Li Bing chose to divide the river rather than block it. Weigh up the advantages and the costs of that decision, using what the passage tells you.

PART C Mark your own work

Now go back to the passage. Tick every answer you got right. You do not need the same words as the answer below — if you wrote the same idea in your own words, it counts.

- ☐ 1 · The Fish Mouth levee, the Flying Sand Weir and Bottleneck Channel. It was added in 2000.
- ☐ 2 · Its bed was cut lower than the outer channel, so in low water most of the river sinks into it. In flood the river runs high and fast, rises above that advantage and spills over into the wider outer channel, so the share reverses.
- ☐ 3 · Because they bend and settle instead of breaking. A rigid wall either holds or fails completely, while a basket of stones gives under the current and can simply be replaced when it wears out.
- ☐ 4 · Deliberate means chosen on purpose rather than accidental. The gap was made small so that it limits how much water can ever reach the farmland, no matter how high the river rises upstream — the narrowness is the safety device, not a flaw.
- ☐ 5 · To underline that the design works by guiding water rather than by overpowering it. After a passage about an engineering feat, admitting there is nothing impressive to look at makes the real point: the cleverness is in the arrangement, not in the size of the structures.
- ☐ 6 · Dividing the water let the river carry away its own flood and most of its own sand, so the system has survived floods, centuries and an earthquake that flattened nearby concrete. The cost is constant attention: it is not sealed, so the channels must be dredged and the baskets renewed year after year, and the eight years of fire-and-water quarrying to cut the gap were brutally slow. In short, Li Bing traded a one-off wall that might fail outright for a flexible system that never fails but never finishes either.

FACTS RECALLED IN PART A

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QUESTIONS CORRECT

— / 6

DATE

THE STRATEGY Elaborative interrogation

After each paragraph, stop and ask yourself one question: why would that be true? Why cut the inner channel deeper? Why baskets instead of blocks? You will not always know the answer, and that is fine — the act of reaching for a reason ties the new fact to things you already understand, and facts with reasons attached are far harder to lose than facts on their own.

WHERE YOU ALREADY DO THIS

Think of something you were shown how to do without being told why — a technique in a sport, or a step in a recipe. What changed once you worked out the reason behind it?

FOR THE PARENT OR TEACHER · This sheet trains delayed recall, not reading speed. Let your teenager read the passage once, then cover it completely before Part A — no glancing back and no prompting, because the effort of hauling a half-remembered

fact out of memory is what fixes it there. At this level mark the thinking rather than the wording: the answers given for the inference, purpose and analysis questions are one good response each, not the only one.