Where Water Reaches

Use census and satellite data to examine flood exposure.

WG.C.1.4 "Utilize geographic technologies and geographical data including census data and imagery to draw conclusions about the influence of geography on the world's people and places."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the location clues for both districts, circle their census counts in the table, and number the two imagery columns 1 and 2 to track evidence you can use in a geographic conclusion.

Flood Evidence in Harbor Bend

1. In the fictional city of Harbor Bend, two districts sit on different land. Lowbank lies beside a river near its mouth, where the ground is low and flat. Ridgeview stands uphill, farther from the river. A 2020 census counted residents in each district. Those counts show where people live, but not which households faced water during a later storm.

2. Researchers compared satellite images taken before and after heavy rain in 2022. They identified buildings within the visible flooded area and estimated tree cover from the earlier images. Tree cover can slow runoff when soil absorbs rain, although paved ground and saturated soil also matter. The table combines these image estimates with census counts.

HARBOR BEND DISTRICT DATA

District	2020 residents (census)	2020 tree cover (satellite estimate)	2022 buildings in flooded area (satellite estimate)
Lowbank	3,200	12%	140
Ridgeview	2,100	38%	8

3. Image evidence shows where water appeared on the dates photographed, not every place that could flood in a different storm. The table counts buildings in the flooded area, not residents inside them. Also, the population count predates the storm by two years. To estimate how many people were affected, investigators would need current household locations and records of actual flood damage.

2 ANSWER WITH EVIDENCE

Use the passage

1. Based on location and the satellite building counts, which district would you investigate for river flooding first? Explain your choice.

2. Which district had more residents in 2020? Why can't that census count alone show which district had more flood exposure in 2022?

3. How might the tree-cover difference affect runoff in the two districts? Use both percentages and include one reason the percentages cannot settle the question.

4. What additional data would you combine with the 2022 satellite images to estimate how many people were affected by the flood? Explain why.

3 YOUR TURN

Your own words

Write three or four sentences proposing a specific flood-planning action for Harbor Bend. Support it with a location clue and two numbers from different table columns, then name one additional dataset needed before directing aid to individual households.

Where Water Reaches

PART 1 · READ AND MARK

Underline the location clues for both districts, circle their census counts in the table, and number the two imagery columns 1 and 2 to track evidence you can use in a geographic conclusion. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Based on location and the satellite building counts, which district would you investigate for river flooding first? Explain your choice.	**Lowbank. It sits on low, flat ground beside the river, and 140 of its buildings were in the visible flooded area, compared with 8 in Ridgeview.**
2	Which district had more residents in 2020? Why can't that census count alone show which district had more flood exposure in 2022?	**Lowbank had more residents, 3,200 compared with 2,100. District totals do not show where residents lived relative to the flooded area.**
3	How might the tree-cover difference affect runoff in the two districts? Use both percentages and include one reason the percentages cannot settle the question.	**Ridgeview's 38% tree cover may help slow runoff more than Lowbank's 12%, but paved ground or saturated soil could change how much rain the ground absorbs.**
4	What additional data would you combine with the 2022 satellite images to estimate how many people were affected by the flood? Explain why.	**Current household locations and actual flood-damage records would help show which occupied homes were affected. Images count buildings in the flooded area, not the people inside them.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Harbor Bend should inspect riverbank drainage in Lowbank before the next storm. Lowbank sits on low ground by the river's mouth, and imagery shows 140 buildings in the 2022 flooded area. Its 2020 census count of 3,200 residents does not show which households flooded. Current address-level damage reports would help officials direct aid to specific households.

Accept other specific planning actions supported by a location clue and two numbers from different table columns. Students should not treat district population or flooded-building counts as an exact count of people affected.