

Where Is Earth's Water?

Ask questions and compare water locations using the correct whole

Name: _____ Date: _____

Part 1 - All of Earth's water

Read the denominator first. Table A uses **all water on Earth = 100%**. The percentages are rounded estimates. An aquifer is rock or sediment that holds groundwater, so it is not a separate slice to add to groundwater.

Table A: Location	Share of all Earth water
Oceans, seas, and bays	96.54%
Ice caps, glaciers, and permanent snow	1.74%
Groundwater - fresh and salty	1.69%
Other water	0.03%

1. Ask two questions that could help a scientist or community learn where water is located. At least one question must mention a location in Table A.

2. Which listed location holds the greatest share of all Earth's water? Compare it with one other listed location in one complete sentence. Include the words *all Earth water*.

Source for Tables A and B: U.S. Geological Survey, "Where is Earth's Water?" n.d. Data are rounded and adapted for this worksheet. <https://www.usgs.gov/water-science-school/science/where-earths-water>

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Part 2 - Freshwater has a different whole

Table B uses a new denominator: **freshwater = 100%**. Do not add a percentage from Table A to a percentage from Table B. USGS estimates freshwater is only about 2.5% of all Earth water.

Table B: Freshwater location	Share of freshwater
Ice, glaciers, and permanent snow	68.7%
Groundwater	30.1%
Freshwater lakes	0.26%
Swamps	0.03%
Rivers	0.006%
Other freshwater	0.904%

3. Complete the sentence: In Table B, 30.1% means 30.1% of _____ is groundwater. Why is an aquifer not another percentage to add to 30.1%?

4. Calculate the combined share of freshwater in lakes, swamps, and rivers. Show the addition and label your answer with the correct denominator.

5. Write two accurate comparisons from Table B. Each comparison must name the denominator, *freshwater*.

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Part 2 - Freshwater has a different whole (continued)

6. Explain why easily reached surface freshwater is a small share of Earth's water. Use one fact about all Earth water and one fact from Table B. Do not say that all groundwater is unavailable.

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Answer key and teaching notes

Materials supplied: student pages with Tables A and B. **Additionally needed:** pencils; optional document camera or board.

Exact setup: Print one three-page student set per student. Display Part 1 only at first, or have students cover Part 2. Students work independently for items 1-2, then complete items 3-6 after a brief denominator reminder. Allow about 10 minutes for Part 1 and 15 minutes for Part 2.

Teaching script: “A percentage needs a whole. Table A's whole is all Earth water. Table B's whole is freshwater. Before comparing any percentages, say the whole aloud. An aquifer is a place that stores groundwater; it is not extra water to add. We can describe easily reached surface freshwater as a small share without claiming that all groundwater cannot be used.”

Observation method: While circulating, make a check mark beside each student who (1) names the denominator in speech or writing, (2) does not add values across tables, and (3) identifies an aquifer as groundwater storage rather than a new reservoir. Prompt, but do not supply, the denominator: “Percent of what whole?” Collect pages and score items 1-6 below.

1. Answers vary. Accept two investigable location questions, such as “How can we determine whether usable groundwater is beneath our town?” and “Where does water from local streams go after it leaves our area?” At least one must clearly concern where water is located. Do not require a particular answer.

2. Oceans, seas, and bays. Sample: “Of all Earth water, oceans, seas, and bays hold 96.54%, much more than the 1.69% held as groundwater.”

3. Blank: *freshwater*. An aquifer holds groundwater, so it describes where groundwater is stored; it is not a separate, additional water category.

4. $0.26\% + 0.03\% + 0.006\% = 0.296\%$ of *freshwater*. Accept an equivalent correctly aligned calculation and label.

5. Answers vary. Sample comparisons: “Of freshwater, ice, glaciers, and permanent snow hold more than groundwater: 68.7% compared with 30.1%.” “Of freshwater, lakes hold more than rivers: 0.26% compared with 0.006%.” Both comparisons must state or unmistakably refer to freshwater.

6. Sample response: “Oceans hold 96.54% of all Earth water, while freshwater is only about 2.5% of all Earth water. Within freshwater, lakes, swamps, and rivers together are only 0.296%, so easily reached surface freshwater is very small. Some freshwater is groundwater, which may be usable in some places.” Award full credit for one accurate all-water fact, one accurate Table B fact, a logical explanation, and no claim that all groundwater is unavailable.

Source credit: U.S. Geological Survey, “Where is Earth's Water?” n.d., <https://www.usgs.gov/water-science-school/science/where-earths-water>. Table values are rounded USGS estimates; the worksheet wording is original.