Ice Beneath Indiana

Trace how glaciers shaped land, soil, and water.

IS.3.3 "Explain how glaciers shaped Indiana's landscape and the contribution that glaciers had in terms of geology, fertile soil, and accessible fresh water resources."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline three actions by ice or meltwater. Circle a landform, a soil benefit, and a fresh water source, then draw arrows connecting each action to a result it helped create.

What the Ice Left Behind

1. Picture a trip across northern Indiana after the last continental ice sheet retreated more than 10,000 years ago. During the last ice age, thick ice advanced from the north, scraping bedrock and carrying broken rock. When the ice melted, it left **till**, a mixture of clay, sand, pebbles, and boulders. At pauses along the ice edge, piles of till built low ridges called moraines. Across much of central and northern Indiana, those deposits shaped broad plains and rolling hills. Parts of southern Indiana escaped this last glaciation and retain steeper hills and exposed bedrock.

2. Ice also helped build the ground that farmers use. On many plains, weathering broke down glacial till, and plants added organic matter over thousands of years. Together these processes produced soils that can hold water and nutrients for crops. Winds carried fine glacial silt, called loess, onto some areas, adding another layer of useful material. Not every glacial deposit makes rich farmland: loose sand often holds fewer nutrients and drains faster than loamy soil. The value of a field depends on its soil mix, slope, drainage, and care, not simply on whether ice once covered it.

3. Meltwater from the shrinking ice carried sand and gravel into old stream valleys, where the grains formed thick deposits. Water later filled spaces between these grains, creating aquifers that people can tap with wells. In northern Indiana, some blocks of buried ice melted and left hollows that filled with fresh water, forming kettle lakes. These lakes offer habitat and recreation, while aquifers supply water for homes and farms. A sand-and-gravel aquifer may yield water readily, but pollutants can also move through it. Communities must protect areas where water enters the aquifer and check water quality before relying on a well.

2 ANSWER WITH EVIDENCE

Use the passage

1. How did moving and melting ice create both till plains and moraines in Indiana?

2. How did glacial deposits help some Indiana farmland develop fertile soil?

3. Why might a sandy glacial deposit be less useful for crops than loamy soil formed from till?

4. How did meltwater deposits create a useful fresh water source, and what risk comes with that source?

3 YOUR TURN

Your own words

A new town sits beside a gently sloping till plain and a sand-and-gravel-filled valley. In four or five sentences, recommend where to plant crops and where to seek a well, explain how glaciers created both places, and name one step to protect the town's fresh water.

ANSWER KEY

Ice Beneath Indiana

PART 1 · READ AND MARK

Underline three actions by ice or meltwater. Circle a landform, a soil benefit, and a fresh water source, then draw arrows connecting each action to a result it helped create. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How did moving and melting ice create both till plains and moraines in Indiana?	**Moving ice carried broken rock. When it melted, it left till across broad areas, while till piled up at pauses along the ice edge formed moraines.**
2	How did glacial deposits help some Indiana farmland develop fertile soil?	**Weathered till and windblown loess supplied soil material. Added organic matter helped produce soil that holds water and nutrients for crops.**
3	Why might a sandy glacial deposit be less useful for crops than loamy soil formed from till?	**Loose sand often drains faster and holds fewer nutrients than loamy soil.**
4	How did meltwater deposits create a useful fresh water source, and what risk comes with that source?	**Meltwater deposited sand and gravel in valleys. Water filled spaces between the grains, forming aquifers that wells can tap, but pollutants can move through the deposits.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would plant crops on the gently sloping till plain because its weathered till can develop soil that holds water and nutrients. The ice left the till when it melted, shaping the broad plain. I would seek a well in the sand-and-gravel valley, where meltwater deposited grains that can hold groundwater between them. The town should test the water before using the well. It should also keep pollutants away from areas where water enters the aquifer.

Accept explanations that connect glacial actions to specific landforms, soil properties, or fresh water resources. For the town plan, accept a well in the valley as a place to investigate, not a guarantee of safe or sufficient water.