

Science Lesson Plan: Indiana Ice Investigations **Length:** 2 days/20 minutes (day 1)
45 minutes (day 2)

Age or Grade Intended: 4th Grade

Academic Standard(s):

4.3.5 Describe how waves, wind, water, and glacial ice shape and reshape Earth's land surface by the erosion of rock and soil in some areas and depositing them in other areas.

Performance Objectives:

Given materials, students will show how Indiana's landscape was formed by glacier periods, with 100% completion.

Advanced Preparation by Teacher:

Find appropriate video informing students about glaciers. Print off transparency of Glacier Gliders. Retrieve 8 blocks of ice, 8 trays, bag of sand and bag of soil, 8 towels. Gather a small garden tool, plastic flower "flat" full of potting soil, and a 6" piece of 2"X4" board. For each group of students, fill one plastic flower flat tray (the type of tray that holds several small containers of four to six flowers) with potting soil in one end (covering about three-fourths of the flat) and sand in the other end.

Procedure:

Introduction/Motivation:

Day 1- Has anyone ever heard of glaciers? Can anyone tell me what glaciers did? Do glaciers still exist today? Well today boys and girls, we are going to watch a video on glaciers to show you what they are and how they shaped our state, Indiana.

Day 2- Alright boys and girls, yesterday we watched a video on glaciers. Today, we are going to do a little experiment of our own to see how glaciers shaped our very own state. Does that sound fun?

Step-by-Step Plan:

Tell students that during the Ice Age, ice covered much of Indiana; during the last glaciations, known as the *Wisconsin glaciations*, ice covered most of the state. The Wisconsin glaciations ended about 10,000 years ago. Place the transparency of the BLM *Glacier Gliders* on the overhead projector. Point to the transparency as you explain to the class that the ice sheet came down from the north to the area where Martinsville is and extended farther south along the western edge of the state. Explain that the portion of state that was covered by glaciers was flattened out and the rich soil that had been gathered by the glaciers was left behind as they melted. Tell students that the melting glaciers also left behind many natural lakes and ponds, particularly in northern Indiana, but that the hills of southern Indiana were left undamaged by the glaciers. Explain that, instead, water from the melting glaciers increased soil erosion in southern Indiana. Point to these areas on the transparency of the BLM *Glacier Gliders*.

Divide students into eight groups of three or four. Give each group a tray full of potting soil and sand. Take the small garden tool and loosen the dirt so that it is not packed down. Put the small piece of 2" × 4" under the sand end of the tray. Place a towel or piece of plastic sheeting under each tray. Give each group a block of ice. Say to students: "Now we are going to do an experiment to see how glaciers formed Indiana's landscape." Explain to the class that the portion of the tray containing sand represents Canada and Michigan, the top part of the soil represents northern Indiana, the bottom of the soil represents southern Indiana, and the ice block represents a glacier. Tell students to place the block of ice in the top part of their trays. Tell them to push the blocks firmly into the soil and then gradually slide them down the tray about three-fourths of the way. Explain that this movement represents how the glaciers advanced to the area around Martinsville. Have students leave the blocks there for an hour, and then slowly slide them back up to the top of the trays to finish melting.

Closure/Assessment:

At the conclusion of this activity, bring the class back together (after cleaning up) and discuss what they learned as an entire group. Ask questions such as: How do glaciers shape the land? What might Indiana look like if the glaciers had reached the Ohio River? How would this have changed life in Indiana? Where could you go today to get some idea of what Indiana might have been like during the Ice Age? Do you think there will ever be another Ice Age?

Adaptations/Enrichment:

For both adaptations and enrichments:

Take students outside to look for evidence of how glaciers shaped the area around the school. Determine whether your school is in the glaciated or unglaciated zone. Overall, I think this is a wonderful activity for both students with learning disabilities and those that are gifted and talented because it is a hands-on activity to learn about the environment that surrounds them.

Bloom's Questions:

Can you recall what shaped our landscape in Indiana? Can you explain what happened? Can you illustrate what a glacier looks like? Can you compare Indiana to other states that were not affected by glaciers? Can you propose what the glaciers did to Indiana? Can you defend that glaciers once existed in Indiana?

Gardner's Multiple Intelligences:

Linguistic Intelligence: Class discussion at the end of activity.

Bodily-Kinesthetic Intelligence: Students will move around to get into groups and use force upon the chunk of ice to visualize what affect the glaciers had on the land of Indiana.

Interpersonal Intelligence: Students will be working in groups.

Intrapersonal Intelligence: Students will have to go within themselves to reach a comfort level in order to work with other students.

Self-Reflection:

What could I do to make this activity more worthwhile for the students?

What improvements can I make for next year?

Information should be added or deleted from project?

How can I encourage the students to want to be able to learn the information about glaciers in Indiana's history?