

Buffalo Trace Education Box Lesson 10

Surveying the Buffalo Trace

Purpose: Students will be introduced to how land surveyors measure an area and the importance of the Buffalo Trace to early survey records.

Subject Area: Math

Materials Needed: twine with ties marked to represent one half of a surveyor's chain (33 feet), compass, sidewalk chalk, paper, pencil, image of early surveying equipment (chain, compass, sector), Indiana territory maps.

Steps:

If weather permits, this lesson works best as an outdoor activity (a playground, a wooded area, or a sidewalk). If outdoors is not possible, use the gym or cafeteria.

1. Discuss the definition of land surveying (establishing on paper the location of landmarks and boundaries by use of measuring tools).
2. Discuss what a surveyor may do (before, during, after) to make the paper survey, called a plat. Surveyors have to be excellent at math and also may be interested in the outdoors, history and geology. George Washington and Abraham Lincoln were surveyors when they were young men.
3. As background information, introduce these two early surveyors and their importance to Indiana boundaries: Thomas Freeman (Vincennes Tract in 1803 which established the Freeman Corner in Orleans, Orange County) and William Rector (Buffalo Trace in 1805 which established the Indian Treaty Line through Indiana).
4. Display the twine (and image of surveying equipment) with the ties. The twine will represent the surveyor's chain. The ties will represent the links. Display these surveying land measurements:
 - 7.92 inches = 1 link
 - 25 links = 1 rod
 - 4 rods = 1 chain (same as 1 pole = 22 yards or 66 feet)
 - 80 chains = 1 mile

In southern Indiana, early surveyors used half a chain. The 33 feet chain was more practical to use in the dense forests, rather than the full 66 feet chain.

5. Provide basic instructions about using a compass and determining the four cardinal directions.
6. Take all the materials outdoors to the area you selected. Have students sketch a picture of the area, noting and counting the landmarks (trees, hills, buildings, walkways, playground equipment).
7. Assign groups to: determine the boundaries, different ways to mark off the area and measurement ideas. If you are near a sidewalk or paved area, mark the cardinal directions with chalk.

Buffalo Trace Education Box Lesson 10

8. Use the twine to measure the boundary lines. Record the measurements and directions with the compass.
9. Back in the classroom, have students write their own descriptions of the area, to go with their sketches.

Below are two descriptions, one from Thomas Freeman and the other from George Washington.

In the survey, the Freeman corner in Section 19 is shown to be 60 miles from the Wabash River, and in Freeman's day he wrote concerning the corner, "very rich level land, timber very large, black oak, hickory, sugar," etc." In making the survey many notations were made; for example, in the survey of the south line he says he started from the mouth of White River on Sunday. In his record of this survey he says that at 32 miles and 41 chains from the Wabash he crossed an Indian trail. The south line is 59 miles long.

George Washington. Land Survey for Daniel Osborne, Frederick County, Virginia, March 30, 1752 (Original document at the Lilly Library at Indiana University, American History Documents)

By Virtue of a Warrant from the Proprietors Office I have Surveyed for Daniel Osborne a certain tract of waste and ungranted land on Potomack joining the upper Side of Daniel Pursleys Land & Bounded as followeth Beginning at two Ashes and an Elm on the river Pursleys Corner and extended up the Meanders of the River N0.61.W. Twenty poles . . . N0.650.W. One hundd. and Eighty poles to a double and Single hoop Wood trees thence S0200.W. Two hundred and Sixty poles to a Large Pine on the point of a hill. thence S0.770.E. Two hundd. and Seventy poles to a white Oak and red Oak Danl. Pursleys Corner . . . thence with his Lines N0.250.W. Two hundd. poles to two chestnut Oaks on the side of a hill & . . . Finally N0.650.W. One hundd. poles to the Beginning Containing Two hundd. and Seventy Acres this 30th: day of March 1752.

10. Provide copies of the actual measurements from a day in William Rector's survey.
11. As an exit slip, have students write statements in response to: What do you learn about a surveyor's responsibilities? What was easy and what was difficult about measuring the land?

Buffalo Trace Education Box Lesson 10

Extensions:

-
- Invite a surveyor to visit your classroom. Contact the Indiana Society of Professional Land Surveyors.
- Research other responsibilities of the early Survey Crew members, such as Party Chief, Instrument Man, Head Chainman, Rear Chainman, axe bearers and hunters.
- Locate the Pivot Point (also called Initial Point) near Paoli in Orange County, which marks the initial survey point for Indiana. Ebenezer Buckingham, Jr., surveyed west in 1805 and marked this pivot point.
- Read "Who Came Down That Road?" by George Ella Lyon
- Discuss the word choice and look up the definition of the words in the Surveyor's Oath: "I do solemnly swear that I will truthfully and faithfully discharge and execute the duties as land surveyor to the best of my knowledge and power and I will use equipment that measures justly and exactly." (Google Search) Modern day surveyors are still doing this important work according to this oath.
- Discuss the meanings of this phrase: "Surveyors were in responsible charge and would always give good measure."

Resources:

- Compass Activities (brighthubeducation.com)
- GPS Lessons (The Science Spot)
- George Washington's survey description was from the website (georgewashington.si.edu/kids/activity4.html)
- Lincoln's surveying equipment is on display in the New Salem (Illinois) State Historic Site. Carl Sandburg wrote about Lincoln's career as a surveyor. The text is at this website. (surveyhistory.org/lincoln_the_surveyor1.htm)
- Thomas Freeman's survey description is from the Indiana Magazine of History by George R. Wilson, Vol 12, Issue 1, pp 1-33.
- The survey land measurements are from a book titled "Woodward's Practical Arithmetic" by R.J. Woodward, 1894.
- Information about a surveyor's responsibilities have come from these Indiana surveyors: David Ruckman and David Blankenbeker.
- The USDA Forest Service (fs.usda.gov) has an information page about the Initial Point.