

Agriculture in **Space**

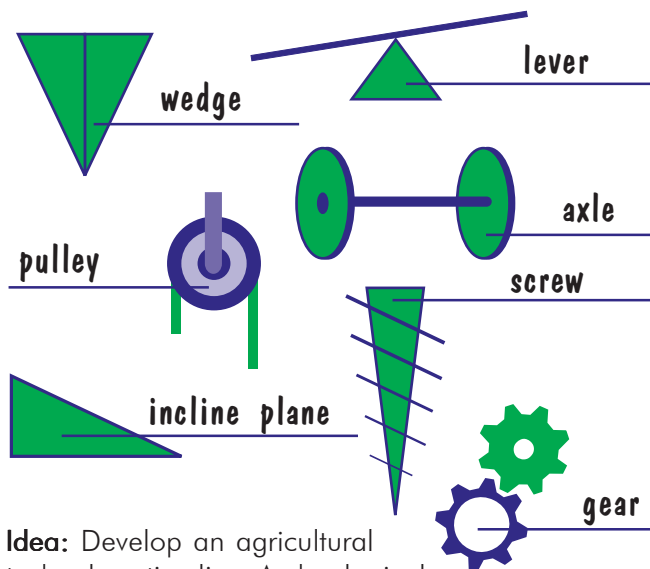
Background: One of the newest technologies in agriculture is Global Positioning Systems (GPS). This involves using satellites in space that send signals to receivers on farm equipment. GPS tracks the exact position of a tractor on the face of the earth by identifying its precise coordinates (longitude and latitude) and then plotting the position on an electronic map. Farmers use GPS to help them apply different amounts of seed and fertilizer to different parts of a field. They program the implement's application controllers so that when the implement is entering a certain area of the field, the controllers change the amount of seed or fertilizer the implement is applying.

Farmers can also use GPS to guide their tractors so they don't overlap when applying fertilizer or other products. GPS can actually steer the tractor for hands-free driving, or it can activate flashing lights on the tractor dashboard to tell the driver if the equipment is drifting off the row.

Idea: Give students a hands-on opportunity to learn about Global Positioning Systems (GPS) by conducting a scavenger hunt. The NDSU Extension Service has 10 Garmin 3 GPS units in a "trunk" ready for any teacher/volunteer/4-H leader to check out to use in the classroom or through non-formal education. The trunk includes a GPS Scavenger Hunt that teaches students how the buttons work on the machine for way-points and navigation. Ten laminated instruction sheets are included. The Extension Service also has 10 laptop computers with the Geographic Information System (GIS) program ArcView 3.2 installed. The curriculum guide called Mapping Our World includes reproducible GPS lessons. Teachers and students can work together to learn GIS. Contact Angie Milakovic, 4-H Youth Technology Specialist, NDSU Extension Service, P.O. Box 5016, Fargo, ND 58105. (701) 231-8091. amilakov@ndsuxt.nodak.edu.

Idea: Research the coordinates (latitude and longitude) of your school and other North Dakota, U.S. and world locations.

Answers to **Name That Tool**



Idea: Develop an agricultural technology timeline. Archeological investigations in North Dakota document the presence of both hunting and gathering and farming people dating back to 2000 B.C. Have students research what major ag technologies should be included on the timeline. Include tools, machine, plants and animals. Also, discuss and include the forms of farm power in order: people, animal, steam engine and gasoline engine.

Answers to Technology **Then to Now**

- 4 small tractor
- 7 satellite in orbit
- 1 hoe
- 6 tracked combine
- 3 horse-drawn plow
- 2 walking cultivator
- 5 four-wheel drive tractor