FISHING LESSONS:

Ahhh! Summer vacation. Time to relax and go fishing.

Not quite. Fishing has become so high-tech and scientific that I sometimes wonder why it's still so much fun. Answer? Because there's so much learning going on.

Fishing technology is fascinatingly complex. There's high-resolution underwater acoustic imaging. Global positioning systems. Bathymetric databases. Chemical pheromones used to drive fish crazy with aggression or desire. Stainless steel hooks. Invisible monofilament line.

All of this equipment was in my brother's boat this week on a small Minnesota lake near the edge of the prairie. We could just as well have been on Lake Wobegon, or a pond near you.

I was the passenger/observer. My brother Sverre was the crew of one, simultaneously monitoring his location via satellite, depth by sonar, speed by throttle and direction by power steering. Once he shouted out: "Cast behind the boat: There's a fish five feet down." His teenage son made a few casts without results as the fish swam away. As he reeled in his facsimile pike fry, I wondered if casting might soon be obsolete, having been replaced by battery-powered underwater drones guided from a wireless transmitter.

Fish science is equally advanced. Guides used to rely on previous experience and trusted rumor. Now guides have become expert -- though uncredentialed -- limnologists, research scientists specializing in lakes and river ecosystems.

For example, the local daily publishes a fishing report. Years ago, the headline might have read, "Walleyes biting on Lake Plantagenet." This year, the July 7 headline read "Water temps reaching the peak in area lakes." From this fact, a scientifically oriented guide named Paul Nelson predicts fish behavior from limnological concepts.

Here's his chain of deductions for an important game fish, walleye pike. Warm water will stimulate algal growth, especially in lakes with "higher water fertility." This will reduce water transparency, forcing walleyes into shallower depths because they are sight feeders, especially during the low-light conditions of dawn and dusk when they typically bite. But because shallow water is weedier, fishermen are advised to use a bottom-bouncer rig to avoid snags.

Paul's chain of deduction is different for another game species, muskies. These are barracuda-style predators who detect prey based on slight changes in water pressure and (or) light refraction from surface water disturbances, which is why he advises the use of surface lures. Also, the normally wary muskies will make more mistakes when the water is clouded with algae.

Advice for largemouth bass, sunfish and perch is also scientific. With bass, it's about the edges (ecotones) between weed species, where these apex predators wait and watch. With sunfish, it's about the age structure of the population with the recommendation to release the big ones back for breed stock. With perch, it's about the termination of the mayfly hatch, which had previously drawn these surface-feeding fish away from the shoreline.

Basically his advice was a short course in lake ecology, emphasizing the upward links between sunlight, water chemistry, phytoplankton, turbidity, food webs and game fish behavior.
Yet, in spite of all the engineering and science involved, our family fishing expedition was great fun, even when my brother and his son came up empty-handed. Why? Some might argue that fishing was little more than an excuse for a father and son to be together. But I think that much of the fun came from the fact that an adult and child were outdoors in the pursuit of a common goal with potentially exciting results.

It's a shame that every bewildered adolescent cannot have such a learning opportunity. My brother, the teacher, had no license to teach. His son, the student, didn't know he was in class. No principal was looking over their shoulders. But on that wonderful morning, I wondered if I wasn't witnessing the conception of a young man's career in either engineering or science.

Fishing is fun, with or without the fish. But children will never come up empty-handed when they learn from their elders, appreciate human ingenuity and explore the natural world.