

What's Your Location?

Name: _____

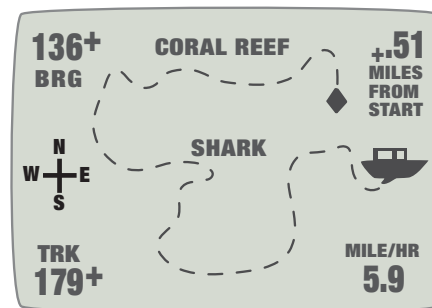
The Global Positioning System (GPS) is making sea travel safer. It can instantly pinpoint a ship's position anywhere on the globe.

See if you can solve these word problems:

- 1 The government spent \$12 billion developing the GPS satellite network (24 satellites orbit the earth). Roughly how much did each satellite cost to build and put into space?

- 2 A lobster boat off the coast of Maine is trying to find a favorite lobster trap. Its onboard GPS unit determines that the boat is 15,000 miles away from the satellite. How long did it take for the signal to reach the satellite if it is moving at 186,000 miles/sec? Round to nearest thousandth of a second.

GPS units create a "Track Log" that shows where the user has traveled. Look at the track log at right and then answer the questions that follow.



- 3 Angie has traveled on a cruise to a beautiful coral reef. She has taken a GPS-equipped kayak out for a spin. Angie's current position is marked with a diamond. What is the safest and fastest way for her to return to the boat?
A. Return the way she came; **B.** Plot a new course southeast

- 4 How fast was Angie paddling her kayak? _____
- 5 How far is she from the boat? _____

Simple Math

Trilateration

The mathematical principle called trilateration sets the basic framework for GPS units. The idea is that it calculates how many miles an object is from four satellites. Ultimately, this information is captured

through a series of spheres. Scientists measure the radii and the places where the spheres overlap to identify specific locations. Visit <http://electronics.howstuffworks.com/gps2.html> for an illustration of trilateration at work.