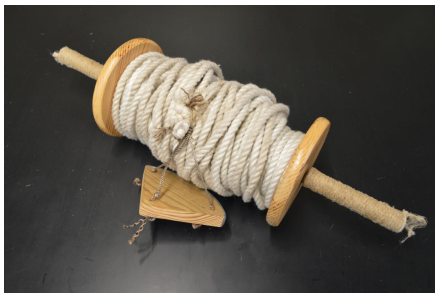
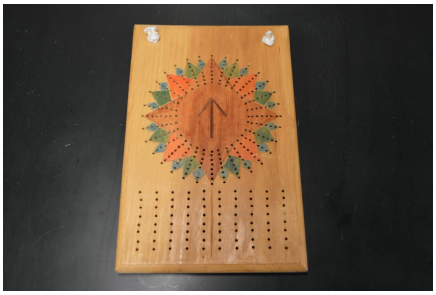
Measuring Speed with the Chip Log

Sailors used a tool called a chip log to find the ship's speed. The chip log was made up of a wooden roller, a long length of rope, and a wooden triangle that was attached to the end of the line (*see photo below, left*). There were knots tied into the rope every forty-eight feet. The triangle, or "chip", would be thrown behind the boat. As the ship moved forward, line came off the roller. Crew members kept track of how many knots went overboard in twenty-eight seconds. The number of knots counted represented the speed of the ship in knots, or nautical miles, per hour. By knowing the ship's average speed over the course of a day, the captain could figure out how far the ship had traveled.



The chip log measured the ship's speed in knots

28-second sand glass



Speed and direction were recorded on the traverse board.

While the vessel's speed was being measured, the captain would look at a compass to see what direction the ship was traveling. This is known as the ship's course. The speed and course were then recorded by placing wooden pegs on an item called the traverse board (*see photo above at far right*). At the top of the traverse board are eight circles where pegs recorded the vessel's course each half hour over the course of a four-hour watch, and at the bottom of the board eight horizontal lines were used to keep track of the ship's speed over that same time period. At the end of the watch, the captain would bring the traverse board down to his cabin and walk out the schooner's course on a chart.

This system of navigation is known as deductive, or ded, reckoning. It was used by sailors for many years to figure out the ship's longitudinal position on the globe. There were a few problems with this system. For starters, the chip log is a crude tool for finding one's speed, and it was not always accurate. When one data point was off by even a small amount, that mistake would be magnified over the course of a four to six-week ocean crossing. This led to sailors being off course by hundreds of miles by the time they reached the end of their voyage. This problem of finding longitude was later solved with the invention of the chronometer, a device which kept accurate time at sea and allowed sailors to find their longitude by comparing differences in time zones.

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NAME: _____ DATE: _____

COMPREHENSION QUESTIONS

DIRECTIONS: Read the text on the previous page, then answer the following questions in complete sentences. Write your answers on the lines provided.

1. What tool did sailors use to measure the ship's speed?

2. Where does the term "knots" come from?

3. What is the ship's "course"?

4. What tool was used to keep track of the ship's speed and course?

5. Sailors kept track of their course and speed to figure out their longitudinal position on a globe. What is this system of navigation called?